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Stephen Louis

**An Empirically Derived Model of Inhibitors to Information Technology (IT) Use
in a Caribbean Firm**

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Stephen Louis

Supervisor: Dr Ashley Braganza

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ABSTRACT

The research investigated the use of IT in Caribbean firms with particular emphasis on identifying inhibitors preventing firms from deriving the desired level of benefit from Information Technology (IT) in their efforts to improve competitiveness. It was conducted within the interpretive paradigm, and used a combination of data collection methods, namely interviews, participant observation and review of documentary evidence.

The research was conducted in Caribbean-owned firms in St Lucia and Barbados, and was predicated on an argument that the business environment in the Caribbean was becoming more competitive, and that there was an expectation that IT would assist firms in the Caribbean to respond to the increased competition. An initial exploratory study based on interviews with 10 IT and business managers in 7 firms in St Lucia and Barbados supported the initial argument that the business environment was becoming more competitive. It also confirmed that managers believed that IT would assist their firms in becoming more competitive. However, the research showed that the firms were only deriving limited competitive benefits from their IT.

An in-depth multi-case study was carried out using 3 business units within a single firm in St Lucia. The study investigated the specific inhibitors that were preventing the firms from obtaining greater benefit from IT. The results revealed that while inhibitors are usually conceptualized and reported in the research literature as distinct factors, when viewed from the perspective of the managers, they were in fact highly interrelated.

The study contributes to a small but growing body of literature that is based on the argument that inhibitors are important factors that need to be investigated separately, rather than being conceptualized as merely the opposite of enablers. The study also demonstrates that the identification of inhibitors can be used as part of a diagnostic process for improving the benefits that firms derive from the IT investment.

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CHAPTER 1: RESEARCH OVERVIEW

1.1 Introduction

The thesis reports on an investigation into how firms in the Caribbean are using Information Technology (IT) to improve their competitiveness and the inhibitors they face in doing so. The justification for the research is based on evidence of strong interest in government, the private sector, academia and the development administration community among others, in exploiting the perceived benefits of IT to improve the international competitiveness of Caribbean countries.

Unlike much of the available research on this subject that focuses on national, public policy or macro-level issues, the research reported in this thesis investigates the IT from a management perspective at the firm level. The research questions investigated are:

1. How are private sector Caribbean firms using Information Technology (IT) to assist in surviving the increasingly competitive business climate?
2. What are the firm-specific factors limiting the contribution that IT can make to the competitiveness of the firms?

The research is conducted through case studies in Caribbean firms.

1.2 Structure of Thesis

The structure of the thesis is outlined in Table 1-1 below:

Table 1-1: Structure of Thesis

Chapter	Title	Content
1	Research Overview	Provides an overall summary of the research. This includes an overview of the justification for the research, supporting literature, approach and methodology, findings, contributions, limitations and opportunities. It allows the reader to gain a complete overview of the research from reading a single chapter.
2	Literature Review	Reviews the streams of literature most influential in informing the research process, and their relevance to the research.
3	Research Strategy and Methodology	Discusses the philosophy and approach to the design of the research, and the methodologies and strategies used in execution.

Chapter	Title	Content
4	Exploratory Study on use of IT by Caribbean Firms	Presents an initial exploratory study (Project 1) designed to identify the most important factors influencing the use of IT by target firms to assist in improving competitiveness.
5	Identification and Analysis of Inhibitors	Following from the results of Project 1, this study focuses on identifying the inhibitors that impede the target firm's ability to gain competitive advantage from IT and analyses the underlying causes. This is based on Projects 2 and 3.
6	Findings and Conclusions	This chapter discusses the results of the research in the context of the relevant literature streams. It also discusses the key findings and contributions of the research.
7	The Research Experience	Reflections on my experience in conducting the research and my personal development as a researcher during this period.

Source: Compiled by author

1.3 IS, IT and ICT

Throughout much of the literature, the terms Information Technology (IT), Information Systems (IS) and Information and Communications Technology (ICT) are encountered. Targett et al (1999) suggest that the difference between IT and IS is that "IT is the equipment, the computers and the telecommunications devices; IS are the channels of communication along which information flows" (p. vii). Ward and Peppard (2002) use a similar description for IT, to that used by Targett et al above, stating that "IT refers specifically to technology, essentially hardware, software and telecommunications networks" (p. 3.). With regard to IS, Ward and Peppard refer to the UK Academy of Information Systems (UKAIS) definition of information systems which is, "the means by which people and organizations, utilizing technology, gather, process, store, use and disseminate information" (p. 3.). Ward and Peppard also state that in the European Union, the term ICT is generally used instead of IT, to recognize the convergence of traditional IT and telecommunications. The term ICT is also the one predominantly used in the so-called "ICT4D" literature stream (Information and Communications Technology for Development) – eg. Heeks (2006).

As this study deals with the application of Information Technology, I will primarily use the term "IT". However, the terms "IS" and "ICT" will also be encountered in this document, as these are often used by other authors whose work is referenced in the study. Unless specifically indicated, the three terms should be treated as interchangeable in the context of this thesis. It is noted that while Ward and Peppard (2002) explain the distinction between IS and IT, throughout most of the text they use the term "IS/IT".

1.4 Background

1.4.1 Geographical Context of the Study

The word “Caribbean” is often used to refer collectively to islands and continental territories that fall within or border the Caribbean Sea, an expanse of ocean falling between North and South America. All of these countries are either former or current dependencies of the United Kingdom, France, Spain, the Netherlands or the United States. However, there is no single geographic definition of which countries are part of the Caribbean.

For the purposes of this study, the Caribbean refers to countries or territories within the Caribbean basin that meet both of the following criteria:

- (a) Are former or current dependencies of the United Kingdom
- (b) Are full members of the organization known as the Caribbean Community (CARICOM)

The list of countries meeting the above criteria is shown at Appendix A

Due to (a) above, these countries all have English as their official languages and have similar historical and cultural backgrounds. They also have similar economic, political and legal systems. The member countries of CARICOM are signatories to a Treaty and other agreements among themselves that cumulatively have the practical effect of coordinating their activities in several spheres, and in pursuing similar economic development policies.

Further, the countries shown at Appendix A all fall into the category referred to as Small Island Developing States (SIDS)¹. Within the international development community this category is recognized as sharing a peculiar set of economic characteristics (Briguglio, 1995; UNCTAD, 2004).

The research reported within the thesis was carried out in 2 Caribbean countries. The above delineation of the geographical scope increases the likelihood that the findings will be generalizable within the group of countries identified.

1.4.2 Challenges facing the Caribbean

Small Island Developing States (SIDS) face a specific set of challenges to their economic development, due to their small size, limitations of natural resources and “remoteness” (Briguglio, 1995). These challenges have to be overcome in order to achieve development objectives.

¹ There is an anomaly in the composition of the SIDS category in that some “coastal” countries that are not islands, including Guyana and Belize in the Caribbean, are included in this category. See UNCTAD (2004) for a discussion of this anomaly.

For many years, Caribbean countries depended on or benefited from a number of preferential and restrictive methods for their development and survival (InfoDev, 2005; OECS Secretariat, 2000; World Bank, 2005b, 2005d). These included significant inflows of development aid from richer countries, preferential treatment for their exports in overseas markets, domestic protection regimes that sought to protect local businesses and industries from foreign competition, and natural barriers to entry such as small market size, distance from metropolitan centres, differences in legal systems and cultural differences that served as disincentives to potential foreign competitors.

More recently, changes in the international economic climate, particularly “globalization” (Read, 2004; Walsham, 2001; Wignaraja, 1999; World Bank, 2000), have forced these countries to find ways to become more internationally competitive. Some of these changes, such as the loss of preferential trading arrangements, threatened the viability of the economies of some Caribbean countries (Williams et al, 1999).

1.4.3 The Potential of IT

Increased use of IT has been championed by many as a vehicle for improving the competitiveness of developing countries such as those of the Caribbean (e.g. Accenture, Markle Foundation and United Nations Development Programme, 2001; Didar-Singh, 2001; InfoDev, 2005). Some of the advocates, such as international development agencies (e.g. World Bank, 2006) and Caribbean-based inter-governmental institutions (e.g. Caribbean Development Bank, 2006b; Caribbean Regional Negotiating Machinery, 2001; OECS Secretariat, 2000), wield significant influence over the decisions and policies of Caribbean governments because of their roles in sourcing, providing or facilitating development assistance for Caribbean countries. There is evidence that Caribbean governments are pursuing policies to use IT as a development tool, as indicated for example, by provisions announced in their annual budget presentations. (e.g. Government of Antigua and Barbuda, 2002; Government of Grenada, 2002).

Much of the literature in the so-called “ICT4D” – “Information and Communications Technology for Development” stream (Heeks, 2006), has focused on public sector issues such as E-government (United Nations, 2005) or macro-level issues such as national IT policies and creating an “enabling environment” that is favourable for IT implementation and use within the public and private sectors (De Boer and Walbeek, 1999; Indjikian and Seigel, 2005, World Bank, 2006). Also, much of the research on this topic and especially that which is specific to the Caribbean, is practitioner-oriented and seemingly targeted at Public Administration practitioners.

There is very little published research on IT use within private sector businesses in the Caribbean and very little evidence of rigorous firm-level research within the private sector in the Caribbean. The observation regarding the lack of rigorous firm-level empirical data in the Caribbean, particularly with regard to IT use, is also made by the

World Bank (2005b), which is currently one of the main sources of empirical data on development issues in the Caribbean. Notable exceptions published firm-level IT research conducted in the Caribbean are Chin et al, (2004) and Wresch and Fraser (2006).

1.4.4 The Importance of a Firm-level perspective

There is a large volume of IS research literature that addresses the question of whether and how IT contributes to organizational performance. In the past, much of this research focused on determining whether there was evidence of a general causal link between investment in IT and firm performance, leading to the “Productivity Paradox” debate (e.g. Byrnjolfsson, 1993; Chan, 2000; Dewan and Kraemer, 1998). While some researchers continue to investigate (and claim to have found) an overall causal link (e.g. Papaioannou and Dimelis, 2007), much of the current research acknowledges that under the right conditions, IT can contribute to firm performance and therefore focuses identifying and predicting these conditions.

The Resource Based View (RBV) of competitive advantage (Barney, 1991) offers a firm-level perspective of competitive advantage. It is being used increasingly in the IS research literature to explore the relationship between IT and firm performance, and particularly the relationship between IT and sustained competitive advantage.

In the Caribbean, despite the preoccupation with the public sector and macro-level issues related to IT use, the importance of focusing on the firm level has been recognized. For example, as Infodev (2005) points out, the firm-level is where the economic impact occurs.

1.4.5 The issue of “Context”

Some authors, notably Walsham (2001), argue that the cultural context in which IT is used is significant in determining whether and how IT contributes to organization performance. Musa (2006) for example argues that the Technology Acceptance Model (TAM) as articulated by Davis et al(1989), needs to be modified to explain technology acceptance in the context of a sub-Saharan African country, since the Davis et al (1989) model did not adequately account for the difference in accessibility of technology, and exposure to technology. Other authors (e.g. Png et al, 2001; Veiga et al, 2001), have used Hofstede’s (1980) dimensions of national culture to model the effects of culture on IT implementation and use in different cultural environments.

Given the above, there is reason to expect that some of the issues surrounding implementation and use of IT in Caribbean firms may differ from what has been reported in literature that is based on research conducted in other contexts. The peculiarities of the Caribbean environment identified in Sections 1.4.1 and 1.4.2 are likely to give rise to circumstances that affect the way IT should be implemented and used.

1.5 The imperative for the research - the gap in the Literature

The available evidence shows that governments, aid agencies and private firms are willing to make significant investments in IT in an effort to improve competitiveness in the Caribbean. They are being encouraged to do so by very influential voices. While there is evidence that IT can contribute to competitiveness, the literature also suggests that potential contribution is contingent on firm specific conditions and the context in which IT is being implemented and used.

Given the prior indications that Caribbean firms are investing in IT with the expectation of achieving competitive benefits, the research needs to explore what benefits they are achieving and what factors are limiting the benefits that could be achieved.

There is very little rigorous firm-level empirical research on IT implementation and use in the Caribbean available. Given the high expectations and the potential high levels of investment, there is an imperative to develop a body of empirical literature that is specific to the Caribbean.

Such research is required not only to inform the decision-making by business and government leaders, but also to help establish or strengthen a tradition of empirically driven planning and implementation.

The research aims to contribute to the nexus of literature that address the contribution of IT to competitiveness within the framework of the RBV, and implementation and use of IT in the Caribbean to achieve development objectives.

The above leads to the research questions for the study (stated in Section 1.1 above).

1.6 Research Methodology and Strategy

1.6.1 Project Structure

The research was executed as a sequence of 3 related projects, with each project serving as a starting point for the next. Project 1 was an exploratory study that sought to establish perceptions and practices of IT use within the target firms. It used a "mini-case" approach based on 10 interviews with business and IT managers in 7 firms in St Lucia and Barbados. The research elicited and analyzed respondents' views on the actual and potential role of IT within their respective firms, with particular emphasis on the use of IT to support or strengthen their competitive positions.

Project 2 used the findings of Project 1 as a basis for an in-depth multi-case study of IT use within 3 business units of a single firm. Project 3 further investigated the inhibitors identified in Project 2. For each of the inhibitors identified in Project 2, it investigated why they existed, their causes and effects and how the inhibitors related to each other.

The use of this project structure not only allowed the overall research problem to be divided into more manageable components, but it also allowed each stage of the research to be fully informed by earlier findings, ensuring that a research design most appropriate for the realities of the research context was chosen at each stage. The project structure is illustrated in Figure 3.1 in Chapter 3.

1.6.2 Research Philosophy

The research was conducted from an *interpretive* perspective (Blaikie, 1993). Within the interpretivist ontology, social reality is deemed to be constructed by the interpretations of the actors who are part of the reality or as Walsham (1995) states: “Our knowledge of reality is a social construction by human actors” (p. 9).

There is evidence of increasing acceptance of the interpretivist ontology in IS research (e.g Klein and Myers, 1999; Markus and Lee, 1999; Orlikowski and Baroudi, 1991) following an earlier period during which the field was dominated by an explicit positivist philosophy (Walsham, 1995). Interpretivism is well-suited to researching information systems in organizations, because, according to Klein and Myers (1999), “Interpretive research can help IS researchers to understand human thought and action in social and organizational contexts; it has the potential to produce deep insights into information systems phenomena including the management of information systems and information systems development.” (p. 67).

The interpretive approach was well suited to the objectives of this research, as it allowed the relationship between IT and the competitiveness of the firms, as well as the inhibitors limiting the contribution of IT, to be investigated from the perspective of the managers. It also helped overcome the potential difficulty caused by non-disclosure of financial data by the target company of Projects 2 and 3, and the limited availability of rigorous third-party empirical data on IT use by firms in the Caribbean.

1.6.3 Use of Case Study methodology

The research was conducted primarily through use of a Case Study methodology (Yin, 2003). Project 1 used a “mini-case” approach (Brown and Bostrom, 1989; Tudhope et al 2000; Weil and Olsen, 1989) with 10 interviews in 7 firms, while Projects 2 and 3 used a multi-case approach, based on 3 business units within a single firm.

This case study methodology is well suited to in-depth studies of phenomena that are better studied within a real-world context. The case study methodology also supports multiple data collection and analysis methods, making it suitable for the Caribbean environment where secondary data sources are not widely available.

1.6.4 Data Collection and Analysis

The primary source of data for the study was interviews with managers in the target firms. Project 1 involved interviews with 10 managers in 7 firms while for Projects 2 and 3, there were a total of 23 interviews with 16 managers. In Projects 2 and 3, the interview data was triangulated with documentary evidence and participant observation data.

The process of data analysis was guided by an overall theoretical framework developed from the literature. However, the empirical data was used to populate the framework through an inductive process informed by the *Grounded Theory* approach (Glaser and Strauss, 1967). It used “microanalysis” (Strauss and Corbin, 1998) for detailed analysis of interview transcripts, progressively building concepts from the data. In Projects 2 and 3, this process was used to identify each type of construct in the framework – Resources, Inhibitors and Contributions. The process was also used for a detailed analysis of the underlying cause and effect relationships among inhibiting factors. These relationships were illustrated using a causal network (Miles and Huberman, 1994).

The Nvivo software package (Richards, 1999) was used to support the collection and analysis of data. Nvivo was used to create and maintain the case database recommended by Yin (2003). The analytical frameworks developed for the research were operationalized in Nvivo as *Tree node* structures, allowing the concepts discovered in the data to be added as “child” nodes. Two features of Nvivo proved particularly useful for the analysis – the “Relationships” feature and the “Models” feature.

Nvivo’s “Relationships” feature allows relationships between nodes to be defined, and for the data that provides evidence of that relationship to be coded with the relationship. The “Models” feature allows the relationship between nodes to be represented graphically, using simple “drag and drop” operations. These features provided the capability to generate causal networks directly from the nodes and data coded in Nvivo.

1.7 Findings

1.7.1 Role of IT in Caribbean Firms

The first phase of the research (Project 1) was designed to address Question 1 and generate an initial empirical assessment of IT use by Caribbean firms that could be used as the basis for further detailed research and analysis. In all the firms in the study, IT was critical to the operations. However, the patterns of use identified from the study showed that the role of IT was mainly limited to supporting improvements in operational efficiency and reduction in cost of operations. Further, despite managers’ understanding of the potential contribution of IT, in practice, the firms’ IT resources were being applied mainly towards providing basic functional capabilities, rather than strategic advantages.

This finding is consistent with the limited empirical data on IT use by Caribbean firms that is currently available (e.g. CARANA Corporation, 2002; Didar-Singh, 2001; Infodev, 2005; Wresch and Fraser, 2006). For example, CARANA Corporation (2002) reported that firms in St Lucia were using IT only for routine administrative business processes, and there was little use for core business activities.

The results also pointed to internal rather than external factors as playing the most significant role in determining whether and to what extent IT made a contribution to the firms' competitiveness. This suggests that within the ICT4D research stream, there is need for more attention to be paid to firm-specific factors, as compared to the dominant focus on environmental factors such as the "enabling environment" (UNDP, 2005).

1.7.2 Nature and effect of inhibitors

The IS research literature that has explicitly studied inhibitors to the adoption or use of IT (e.g. Cragg and King, 1993; Debreceny et al, 2002, King and Teo, 1996; Luftman et al, 1999; Teo et al, 2006) has generally conceptualized and reported inhibitors as discrete factors. The results of this research show however, that the inhibitors were highly interrelated, both in their causes and effects.

In each of the cases, the high level of interconnectedness among the inhibiting factors was reflected in the emergence of groups or "clusters" of nodes in the causal network. In the Drugstore case, 6 clusters were identified, with the largest one accounting for 23 of the 53 nodes in network, or just over 40% of the nodes. In the Home Store and ABCGI cases, only 2 clusters emerged in each case, and in each of these, the larger cluster accounted for over 60% of the nodes.

The fact that in each case a dominant cluster emerged indicates that from the perspective of management, a significant proportion or most of the inhibitors they face are related. This has implications for the way inhibitors are represented as a theoretical concept as well as the way in which inhibitors are treated by practitioners attempting to diagnose or resolve difficulties with IT use.

1.7.3 Importance of selecting IT Resource

Makadok (2001b) explains that one of the mechanisms firms use to create economic rents is *resource picking* – being better than their rivals at selecting resources. Within much of the RBV literature however, there is an implicit assumption that a firm can easily get the IT technical resources that it requires and there is generally little discussion about how firms can ensure that they have the "right IT". Such an assumption would be consistent with the "IT is a commodity" argument advanced by many authors, but perhaps most controversially by Carr (2003).

The results showed however, that even with IT expertise and adequate financial resources, one of the firms in the study selected and implemented an IT application that did not provide the required functionality. This reinforces Makadok's (2001b) arguments about the importance of resource picking and also suggests that the ability to select the "right IT" (Melville et al, 2004), is an important resource for a firm. The importance of the resources is likely to increase with the complexity of the firm's requirements. It also provides support for Piccoli and Ives (2005) argument that the documented high failure rate of IT projects casts doubts on the hypothesis that IT resources are "easily replicable".

1.7.4 Relationship of Inhibitors to External Environment

The research conducted in Projects 2 and 3 used a conceptual model derived from one proposed by Melville et al (2004). The model used for the research contained only one domain – the "focal firm. However, the Melville et al (2004) model contained two additional domains:

- The "competitive environment" in which the focal firm operates.
- The "macro environment" denoting "country- and meta-country specific factors that shape IT application for the improvement of organizational performance" (p. 297).

The results of the research showed that the external environment can be a source of inhibitors. One implication of this observation is that efforts to improve firm-level use of IT by macro-level interventions in the "enabling environment" may be more effective if they target specific inhibitors that have been identified in this way. For example, in addition to programmes to develop skills in "complex deployment and utilization of ICT" as suggested by Infodev (2005), governments in the Caribbean may be well advised to consider development of skills in the management and application of ICT in specific sectors, such as retail. Also, governments may wish to consider whether certain aspects of existing legislation should be amended to be more amenable to allow businesses to eliminate some cumbersome manual procedures.

1.8 Contributions

1.8.1 Contributions to Theory

1.8.1.1 Importance of identification of inhibitors

The results of this research reinforce the importance of identifying and understanding inhibitors as an approach to studying various issues related to IT adoption and use. Early authors who explicitly used the concept of inhibitors (notably King and Teo, 1996), considered them only as the opposite or absence of *facilitators*. More recently some authors have articulated the need for recognizing and studying inhibitors as separate factors in their own right. (Cenfetelli and Benbasat, 2003; Cenfetelli, 2004, Teo et al, 2006). Cenfetelli (2004) has argued that inhibiting and enabling perceptions are independent and can coexist.

The results add to this small but important area of research and further extend it by showing that contrary to the typical presentation of inhibitors in the existing literature as discrete factors, they can in fact be highly interrelated factors that act upon each in cause-and-effect relationships, forming networks and clusters. By making inhibitors and their relationships explicit, our ability to explain their assistance and propose methods of eliminating them will be considerably improved.

1.8.1.2 Further Clarification of the RBV and Relevance to Managers

The research has helped to address some gaps that still exist in the body of literature that has built up around the RBV. Despite its popularity, the RBV has been subjected to many criticisms, including “inattention to the mechanisms by which resources actually contribute to competitive advantage” (Eisenhardt and Martin, 2000) and failure to provide effective prescription for managers (Priem and Butler, 2001a, 2001b). Priem and Butler (2001a) also pointed to the need for further explanation of why some heterogeneous resources generate value and others do not.

Firstly, the identification of the inhibitors and the mechanisms by which they limit the contribution of resources to competitive advantage helps further clarify the RBV. The study illustrated how inhibitors undermine the attributes identified by the RBV as being necessary for deriving sustained competitive advantage from IT. This included reducing the value that can be realized from available resources and limiting the organizations ability to combine resources in ways that would enhance the attributes of rareness, imperfect imitability and non-substitutability.

Secondly, the research has helped to address concerns about the lack of managerial prescription in the RBV by offering a means of bridging the gap between the RBV’s assertions and managerial action. Identification of inhibitors will allow managers to identify instances where the potential for gaining sustained competitive advantage is not being realized. Once these inhibitors have been identified, managers will then be in a position to take action to eliminate the inhibitors or reduce their severity.

1.8.1.3 Understanding IT Management and Use at the firm level in the Caribbean

Despite the strong advocacy for greater use of IT by Caribbean firms, there is a paucity of empirical data on firm-level IT use within the Caribbean. Within the ICT4D literature stream, there is also relatively little research that is specific to Caribbean countries, compared to other developing countries. Given the arguments about the importance of context that have been advanced by some authors (e.g. Avgerou, 2001; Walsham, 2001), it is necessary to develop a body of firm-level research that is specific to the Caribbean to allow assessment of the extent to which the assertions of the “IT value” and ICT4D streams, derived from other contexts, are supported within the Caribbean context.

This study contributes to both of the above streams by providing an initial insight into IT adoption and use in a Caribbean firm, that can become part of an accumulation of knowledge of IT in that context. It also shows that through explicit identification of inhibitors, it is possible to make a direct connection between the “enabling environment” for IT use, and firm-level use of IT.

1.8.2 Contributions to Practice

1.8.2.1 Identification of Inhibitors as a Diagnostic tool

The process used to identify the inhibitors in this study provides a basis for development of a diagnostic tool that will increase the practical value of the RBV for managers. As discussed earlier, the lack of prescription for practitioners has been identified as one of the shortcomings of the RBV.

While the process is grounded theory, it allows for a high level of engagement with the management of the firm and can be used as a participatory process that will help secure management “buy-in”. It also offers the potential to be developed into a diagnostic tool for identifying ways to derive greater competitive benefit from existing IT or from new IT investments. Further, the “disaggregation” of the inhibiting factors not only allows root causes of the problems to be identified, but also provides a basis for determining what aspects of IS research and practice are most relevant to solving the problems.

1.8.2.2 Empirical basis for Government IT interventions in Private Sector

Some governments in the Caribbean have been sufficiently persuaded about the potential of IT to contribute to the competitiveness of their economies, that they have committed financial resources towards accelerating IT adoption and use at the national level (e.g. Government of Antigua and Barbuda, 2002; Government of Grenada, 2002). This is being done despite the limited availability of empirical data on IT use in the private sector in the Caribbean.

This study provides an initial insight into how some private sector firms use IT, and adds to the limited base of empirical data currently available. It can also be used as the basis for further investigation, as discussed under “Opportunities for Further Research” below. Further, by identifying inhibitors that prevent firms from using IT to generate competitive advantage, and illustrating how these inhibitors are related to the external environment, the study provides an empirical basis for determining specific actions that should be taken by governments to strengthen the “enabling environment” for IT adoption and use.

1.9 Limitations and Opportunities for Further Research

1.9.1 Limitations

One of the main limitations of the research is that like other case study research, it faces the issue of generalizability. While the theoretical sampling used (Eisendhardt, 1989; Yin, 2003) improved the possibility of generalizability to similar firms, the firms selected for the research are not necessarily “typical” Caribbean firms and may not exhibit the range of issues experienced in other firms.

A second significant limitation is the absence of financial data to be used as “objective” measures of value, or as a means of triangulating the interview data. While the views of the managers provided a good alternative basis for determining the benefits derived from IT, a more thorough analysis that would be better able to explore alternative explanations, would have been possible if financial data was available.

1.9.2 Opportunities for Further Research

The limitations of the research, particularly with regard to the generalizability, can be overcome with further research. One of the main opportunities is to use the inhibitors identified in this study as the basis of an instrument for a broader investigation of inhibitors in other types of Caribbean firms. Such research can also be used as the basis for designing a practitioner tool for diagnosing inhibitors to IT use in firms, and identifying opportunities for overcoming them.

Another opportunity is to carry out a comparative study among competing firms. The focus of the study has been on the contribution of IT to competitiveness. In Project 2, the managers made a number of assertions about their competitive positions vis-à-vis competitors. For example, the General Manager of Home Store believed that Home Store’s use of IT had given it a competitive advantage, but that if the competitors had “done as good a job” in implementing and using IT, they would be much more competitive against Home Store. A study that compares what each competitor sees as the contribution of IT to its relative advantages and disadvantages to other competitors will provide an opportunity to validate findings about the inhibitors and contributions.

While the analysis presented in this thesis addresses how inhibitors weaken the ability of IT-related resources to be valuable, rare, imperfectly imitable and nonsubstituable, and reduce their potential contribution to achieving sustained competitive advantage, there is an opportunity to investigate the weakening mechanisms in greater depth. For example, a more in-depth investigation of the “severity” of each inhibitor – how much of an impact each inhibitor has (Teo et al, 2006) would allow for greater guidance on where management efforts should be focused.

1.10 Chapter Summary

This chapter provided an overview of the research. It identified the research questions, explained the justification for the research and outlined the methodology used to execute the research. It summarized the main findings and the contributions of the research to both theory and practice. It also acknowledged some of the limitations and identified opportunities for further research.

The next chapter begins the detailed description of the research by reviewing the key literature that provided the justification for the research and informed the design.

CHAPTER 2: LITERATURE REVIEW

2.1 Chapter Introduction

This Chapter discusses the main streams of literature that informed the positioning of the research and that provided the basis for developing the research questions. The literature also provided the basis for developing the analytical frameworks discussed in Chapters 3 and 5.

Section 2.2 outlines the approach adopted in identifying and reviewing relevant literature for the research. Sections 2.3 and 2.4 review the circumstances and arguments that lead to increased interest in IT as a vehicle for development in the Caribbean. Section 2.5 addresses the importance of the context in which the research is conducted. Section 2.6 reviews the literature on the contribution of IT to business performance, and leads to a discussion of the use of the Resource-Based View (RBV) in IS research in section 2.7. Section 2.8 introduces the concept of inhibitors and why they need to be factored into the research. Section 2.9 presents a summary of the main arguments developed in the literature reviews while the research questions are derived in Section 2.10. The positioning of the research is illustrated in Section 2.11.

2.2 Literature Review Strategy

The literature review was carried out using guidance provided by Hart (1998) and other authors. The process I used was highly iterative and might be compared to a whirlpool – it went around in circles but progressively moved towards a point of convergence.

The following outlines the main strategies used in carrying out the literature review:

- A list of initial keywords and concepts related to the general ideas about the research were developed. This included terms such as “information systems”, “information technology”, “developing countries”, “Caribbean”, “competitiveness”, and “competitive strategy”. The list of keywords was developed incrementally based on prior knowledge, review of well known texts, discussions with lecturers and colleagues and generally from sources that pointed to possible directions and paths for the research.
- The initial keywords were used for initial searches of literature sources. These included the following:
 - EBSCOhost Research Database (website: <http://web.ebscohost.com>)
 - Proquest (website: <http://umi.proquest.com>)
 - Social Science Citation Index (website: <http://wok.mimas.ac.uk/>)
 - Index to Theses (website: <http://www.theses.com>)
 - Google “Scholar” (Beta) (website: <http://scholar.google.com>)

- The titles and abstracts were briefly reviewed and those sources that appeared most relevant were selected for further review. Selected references cited in those sources were also identified and reviewed. For journal articles that seemed particularly relevant, the Social Sciences Citation Index was also used to identify other articles citing them. This served two purposes: (a) It allowed the chain of discussion to be followed forward and (b) in some cases it gave an indication of how influential an article had been.
- Recognizing that there was a lack of published research on IT in the Caribbean and that much of what may exist would have been done under the auspices of government institutions or development agencies, I contacted several government officials in St Lucia whom I expected to have knowledge of the government's plans for developing IT in the private sector. In at least 2 cases this was followed up with formal meetings. The main purpose of these contacts was to identify documents that existed that could provide information relevant to the research.

As the research progressed, I developed a list of keywords representing themes that were relevant to the subject of the investigation, and used these for classifying the literature.

- The bibliographic data was documented using *Procite*, a bibliographic software package. This allowed me to maintain a flexible categorization according to keywords. Where documents were available in electronic format Procite also allowed me to maintain links to the documents.
- As the research progressed and the direction of the research became clearer, I was able to use the keywords to select the most relevant literature for more detailed review. In the final preparation of the thesis, a total of just over 400 pieces of literature, approximately 75% of which were journal articles, were reviewed in detail. The literature cited in the thesis represents a final selection from that subset.

2.3 The “Development” Perspective

2.3.1 The Caribbean Environment – Small and Constrained

The international development community recognizes a special category of countries referred to as Small Island Developing States (SIDS). (UNCTAD, 2004) These countries, due to their small size and resource constraints face a peculiar set of challenges in trying to compete and survive in the world economy (Briguglio, 1995). While UNCTAD (2004) concedes that there is no formally agreed definition of what is a SIDS, there is nonetheless a list of SIDS recognized by the United Nations Secretariat (UNCTAD, 2004, p96) and which includes the Caribbean countries listed in Appendix A.

Briguglio (1995) classifies the disadvantages of SIDS under five (5) headings:

- small size
- remoteness and insularity
- disaster proneness
- environmental fragility
- other factors

According to Briguglio (1995), small size is considered disadvantageous for reasons of:

- (i) limited natural resource endowments and high import content
- (ii) limitations on import-substitution possibilities
- (iii) small domestic market and dependence on export markets
- (iv) dependence on narrow range of products
- (v) limited ability to influence domestic prices
- (vi) limited ability to exploit economies of scale
- (vii) limitations on domestic competition
- (viii) problems of public administration

Briguglio also identifies remoteness and insularity as contributing to:

1. high per-unit transport costs
2. uncertainties of supply
3. the need to maintain large stocks

In the Caribbean, as in other SIDS, this gives rise to business being less competitive than those in developed and even in other developing countries. Consequences include:

- limited choice of products for consumers
- higher prices
- inability to provide certain products “on demand” due to the need to import
- lower product quality
- lower quality of service

In the past, businesses in the Caribbean and Caribbean economies in general had been able to survive even while being less competitive than the counterparts elsewhere. (InfoDev, 2005; World Bank, 2005b) Recent international developments have made the situation more difficult for them however, as discussed in the next section.

2.3.2 New Pressures and Challenges

For many years, Caribbean countries depended on or benefited from a number of preferential and restrictive methods for their development and survival (InfoDev, 2005; OECS Secretariat, 2000; World Bank, 2005b, 2005d). These included:

- Significant inflows of development aid from richer countries
- Preferential treatment for their exports in overseas markets, including in many cases, guaranteed prices and quotas
- Domestic protection regimes, including both tariff and non-tariff barriers that sought to protect local businesses and industries from foreign competition by preventing the entry of foreign produced goods and services or making them less competitive
- Natural barriers to entry such as small market size, distance from metropolitan centres, differences in legal systems and cultural differences that served as disincentives to potential foreign competitors.

This scenario allowed several businesses to survive and even thrive with structures, strategies and operating procedures that were unresponsive to several of the pressures that businesses in developed countries have become accustomed to. InfoDev (2005) for example, asserts that “with notable exceptions, the economies of the Caribbean contain firms that have persisted through artificial protections, commoditized products, or the exploitation of natural resources” (p. 10)

While UNCTAD (2004) presents arguments for special treatment of SIDS that would allow them to continue to enjoy special concessions with regard to international aid and trade, the World Bank (2005b) argues against such special treatment for the members of the Organization of Eastern Caribbean States (OECS), on the basis that this has pushed the subregion and its entrepreneurs towards uncompetitive production:

“Reliance on special and differential treatment as a way of relating to the world economy has not served the sub-region well, over the long term. Preferences and the maintenance of non-reciprocal protection of the domestic market have pushed the subregion, and its entrepreneurs, toward areas of production in which they ultimately can not be competitive and which cannot support the sustained growth in incomes and employment needed to reduce poverty and deepen social development.” (p. ix)

The World Bank (2005b) report further argues that the concessions have “engendered a growing inward orientation of the private sector” (p. ix). The overall view of the report is that the private sector in the Eastern Caribbean states (which includes St Lucia) will become stronger if firms are allowed to face greater international competition.

In recent years, Caribbean SIDS, like many other developing countries, have had to face a number of new challenges due to the changing global economic environment, particularly with regard to “globalization”, trade liberalization and the consequent effect on the competitive environment in which the countries operate (Read, 2004; Wignaraja, 1999). These pressures have been enhanced by the rapid spread of IT which has among other things, contributed to lowering barriers to trade and integrating the world economy (Accenture, Markle Foundation and United Nations Development Programme, 2001).

The World Bank in its *World Development Report 1999/2000*, referred to globalization as “the progressive integration of the world’s economies”. (World Bank, 2000 p.2). Read (2004) describes globalization in terms of the “increasing degrees of international integration, interaction and interdependency between countries and other economic agents in the world economy. (p. 366) He also argues that “globalization represents a particularly significant threat to the continued survival of many successful small island states as independent entities given the greater susceptibility of their economies to changes in the international system”. (p. 365). Some authors (e.g. Walsham, 2001; International Monetary Fund, 2000) also point out that the term “globalization” has become both popular and emotive, with factions holding strong views as to whether the trend is good or bad for human development or for their particular interests.

There is evidence that government and business leaders in the Caribbean as well as institutions within and outside the Caribbean that exert influence on the policies of Caribbean governments, have recognized the potential negative impact of the changing international economic climate on the Caribbean. In particular, they have acknowledged the imperative for undertaking changes that will improve competitiveness within the Caribbean region, at both the macroeconomic and firm levels.

The Secretariat of the Caribbean Community (CARICOM), publishes the *Caribbean Trade and Investment Report* every 5 years to provide an assessment of trade and investment in the Caribbean, to guide policymakers. The 2005 report (CARICOM Secretariat, 2006) acknowledges that the region faces a significant disadvantage because of low international competitiveness and highlights this by showing the poor performance in global rankings:

“Competitiveness of the Caribbean economies, continues to be a cause for concern, whether it is in the traditional agricultural and light manufacturing sectors or a more modern sector like tourism. Three (3) CARICOM countries have been mentioned in the World Economic Forum’s 2005 Growth Competitiveness Index ranking for 117 countries. Trinidad and Tobago’s rank is 60, down nine places from the previous year; Jamaica’s rank is 70, down five places; and Guyana’s rank is 115.” (CARICOM Secretariat, 2006 p. xxxii)”

The Organization of Eastern Caribbean States (OECS Secretariat, 2000), attributed a downturn in the economic performance of the member territories during the decade of the 1990s to the following “weaknesses in the structure of OECS economies” (p. 9):

- A lack of resilience, diversity and competitiveness;
- An over-reliance on public-sector led growth.
- High reliance of trade preferences;
- Continued rigidity in trading patterns;
- Increased import demand/lagging export capacity;
- A lack of capacity within the private sector.

An example of a structural weakness that has created an imperative for change is the threat of collapse of one of the traditional pillars of the economy – agricultural exports. Williams et al (1999), in discussing the potential impact of the loss of preferential treatment in the European Union (EU) market for banana exports from the Windward Islands (Dominica, Grenada, St Lucia and St Vincent and the Grenadines), attributed “robust” growth in the economies of these islands during the 1980s to the preferential access. The authors argued further that loss of preferential access would affect not just the viability of the industry but also of the economies of the islands.

In justifying the recommendations proposed in its *Development Strategy* for member states, the OECS Secretariat (2000) emphasized that:

“In order to survive the onslaught of globalisation and liberalisation, the OECS States must accelerate their transition, from a world of protected market access for key products and large concessionary aid flows, to a world which is going to be more competitive and market oriented.” (p.10)

The World Bank (2005b), in relating the need to improve competitiveness at the national level to improving competitiveness at the firm level, states:

“If the OECS is going to pursue a private sector-led, export-oriented growth strategy, local firms accustomed to a protected domestic market will have to improve their capacity to compete globally. At the firm level, innovation is the key to building and maintaining competitive advantage.” (p. xii)

In St Lucia, the National Economic Council, a government-appointed advisory body on economic policy and strategy with significant private sector influence, identified the need to restructure local businesses as a priority, if the country were to become more competitive:

“In the current international economic context both large and small businesses need to restructure and become more aggressive about their own futures if they are to successfully contend in the fierce international competitive environment”. (St Lucia National Economic Council, 2005, p. 31).

Wignaraja (1999) draws on the experience of several developing countries in building national competitiveness and discusses implications and recommendations for competitiveness in light of globalization. He notes that one of the outcomes of globalization is the creation of a global marketplace for goods and services that is “largely indifferent to national borders and governmental influence”.

This notion of the global marketplace being largely indifferent to national borders and governmental influence is particularly important in the context of the research, as it emphasizes the point that Caribbean businesses facing competition from foreign concerns cannot expect that their governments will be able to change the competitive dynamics through protectionist or interventionist methods. Wignaraja (1999) also

acknowledges the role of technology in augmenting the pace of globalization by reducing natural barriers and other impediments to change.

One major technological development that has facilitated the lowering of barriers to entry is the increasing use of the Internet and the spread of electronic commerce (e-commerce). This has made it relatively easy for consumers in the Caribbean to access products sold overseas, particularly in North America, thereby opening up local businesses to competitors who need not be physically present.

Fraser and Henry (2007) report on a study of online purchasing patterns of consumers in Barbados. The results showed a rapid increase in Internet use in Barbados in recent years, citing statistics from the International Telecommunications Union (ITU) that showed that the number of Internet users in Barbados increased by approximately 50,000 in the 2003/2004 period. The results also show increasing use of the Internet for purchases, stating that 90% of respondents identified the United States as the primary source of purchase, with books and computers being the most frequent type of purchases. The authors also argue that the long-term implications of their findings could be “disturbing” for local retailers, as approximately 50% of the respondents indicated that they intended to increase their amounts of Internet purchases over coming years. They also specifically identified the Insurance and Banking sectors as being threatened by this trend.

The changes in the global economic environment and the pressures that they have created for countries such as those of the Caribbean, have created an imperative to find new ways to sustain the economies and to improve competitiveness. Information Technology (IT) has been promoted as a tool for addressing these challenges, as discussed in the next section.

2.4 The promise of IT

Within both the academic and practitioner literature, IT has been promoted as a vehicle for assisting developing countries such as those of the Caribbean to improve national competitiveness and achieve socio-economic development objectives. The stream of literature that focuses on the use of IT as a tool for socio-economic development is often referred to as the “Information and Communications Technology for Development or “ICT4D” stream (Heeks, 2006; Walsham and Sahay, 2006).

Within the Caribbean, advocates of ICT-led strategies have included Caribbean-based inter-governmental organizations (e.g. Caribbean Development Bank, 2006b; Cleland and Gomez, 2003), international development agencies (e.g.; United Nations, 2005; World Bank, 2006) influential “thought leaders” (e.g. McIntyre, 2000) and advisory or sector groupings at the national level (e.g. St Lucia National Economic Council, 2005). Such advocacy has been taking place since the decade of the 1990s (e.g. Hanna, 1991; Schwere and Hume, 1996).

Following the 2000 G8 Summit in Okinawa, Japan, Accenture, Markle Foundation and the United Nations Development Programme (UNDP) formed a public-private partnership to launch the “Digital Opportunity Initiative” (DOI) which aims to “help mobilize, focus and coordinate action by developing a strategic approach to harnessing the benefits of ICT [Information and Communications technologies] for sustainable development”. (Accenture, Markle Foundation and United Nations Development Programme, 2001). Among the conclusions of the group’s report (Accenture et al, 2001) is the assertion that “an explicit focus on using ICT in pursuit of development goals allows countries to achieve a wide diffusion of benefits from ICT and contributes to both broad-based economic growth and specific development goals.” (p. 6). The report also identifies opportunities for ICT to contribute both as a production sector in itself and also as an “enabler of socio-economic development”.

Sir Alister McIntyre, Chief Technical Adviser to the Regional Negotiating Machinery (CRNM), a body established by Caribbean governments to coordinate trade negotiations in international fora, addressed the urgent need for Caribbean countries to become more internationally competitive while delivering a speech under the auspices of the Caribbean Development Bank (McIntyre, 2000). He too alludes to the perceived potential of IT and states:

“Governments are already taking steps to enlarge capacities in the field of Information Technology (IT) at several levels starting from data entry to the development of software. Governments are right in spotting this as a major opportunity for the Caribbean because of our special advantages of being close to the US market, English-speaking with acceptable educational standards. But we have to move very quickly in a field where there are many and an increasing number of competitors.

We must basically try to embed Information Technology throughout all the sectors of the economy, making it a basic instrument of doing business whether it is in its applications to production management, quality control or marketing.”

In its 2005-2009 *Strategic Plan*, the Caribbean Development Bank, (Caribbean Development Bank, 2006b), an institution that exists to provide loan and grant assistance to Caribbean countries, expressed strong support for use of ICT as a tool for enhancing the development in its Borrowing Member Countries (BMCs):

“The information and communications technology (ICT) revolution has presented small economies like CDB’s BMCs with unprecedented opportunities for increasing their rate of knowledge and skills acquisition, introducing new economic activities and modes of production, and promoting cutting-edge efficiencies across a broad range of societal pursuits and at lesser cost than was hitherto envisaged. Apart from effects on production, the opportunity to enhance equality of access to education and training can improve the capacity of BMCs to participate in the world economic system and to reduce poverty. To leverage these technological advances for increasing economic growth and reducing poverty, BMCs will need to

facilitate rapid improvement to their technology infrastructure and related regulatory framework” (p. 6).

Several Caribbean governments have been sufficiently persuaded by these arguments to commit national resources to ICT projects, and to commit themselves politically to making ICT a prominent feature of national development policies. This is reflected in major policy statements such as the annual national budget presentations. (e.g. Government of Antigua and Barbuda, 2002; Government of Grenada, 2002; Government of St Kitts and Nevis, 2003; Government of Dominica, 2000).

The Government of Antigua and Barbuda in its 2002 budget presentation, (Government of Antigua and Barbuda, 2002) announced a reduction in tax concessions as a means of improving government revenue but identified “Information Technology” as one of only three areas, along with Agriculture and Tourism, where the government would continue to provide concessions.

In presenting the 2003 budget (Government of Grenada, 2002), the Minister of Finance of Grenada stated the government’s expectation of the role of ICT as follows:

"Information and Communication Technology (ICT) is the vehicle that Grenada is using to become a knowledge-based society. Government’s goal is to establish ICT as a dynamic force, and place it in the centre of Grenada’s social and economic development."

In addition to announcing projects to implement new IT systems within government operations, the Minister identified Information and Communications Technology as one of the sectors for which fiscal incentives would be offered for private investments.

In his 2005 New Year’s Address (Government of St Lucia, 2005a), the Prime Minister of St Lucia announced that reducing unemployment was one of the government’s objectives for the year. He identified investment in the “Information Technology Sector” as one of the strategies for achieving this:

"How, you may ask, will Government reduce unemployment? The Government will employ four strategies. First, it will intensify investment in tourism; Secondly, it will continue to encourage more investment in the Information Technology Sector, particularly Business Process Outsourcing (BPO)"

Also in 2005, the World Bank approved loan financing of approximately US \$2.7 million for 5 Caribbean countries – Dominica, Grenada, St Kitts/Nevis, St Lucia and St Vincent and the Grenadines, to undertake a Telecommunications and ICT Development Project. The stated development objective of the project was to improve the access, quality, and use of telecommunications and ICT services to achieve socio-economic development in participating countries (World Bank, 2005c). This project was a follow-up to an earlier project in the same countries (World Bank, 2005a) to

reform the Telecommunications industry so that it better supported the development of IT.

Proponents of IT as a tool for development in the Caribbean recognize two different ways IT can contribute to development (a) as an economic sector whose output can be exported (referred to as an “output sector” by World Bank (2005b) and a “product sector” by Cleland and Gomez (2003) and (b) as an “enabler” of production of other goods and services in the economy (World Bank, 2005b).

Much of the advocacy thus far has focused on the potential for exporting IT services (Cleland and Gomez, 2003; Emerging Market Economics, 2007; Government of Saint Lucia, 2005b). The National Export Development Strategy developed by the Ministry of Commerce of the Government of St Lucia (Government of Saint Lucia, 2005b) identified “Information Technology” as one of 10 priority sectors for the development of exports in the period 2004-2008. In a study on the potential for increasing St Lucia’s ICT-related exports undertaken for the Government of St Lucia, Emerging Market Economics, a UK-based consulting firm, compared St Lucia’s capability for export of ICT services to that of recognized international leaders such as India, Singapore and Ireland, and regional leaders such as the Dominican Republic (Emerging Market Economics, 2007). The study found that St Lucia had relatively few comparative advantages and that the country’s IT labour pool, particularly those individuals with the ability to engage in higher level activities such as software development, is quite limited.

With regard to the role of IT as an enabler, most of the attention thus far seems to be on use of IT for public administration and government-driven applications, particularly “E-government” (United Nations, 2005) and on creating an “enabling environment” at the national level that is favourable to the adoption of IT.

There has been comparatively less attention paid to the adoption and use of IT by private sector firms that are not IT service providers. InfoDev (2005) points out the need for greater attention to the firm-level use of IT and states:

"The ultimate objective of any ICT initiative in the region should be to grow Caribbean economies through the appropriate use of ICT. Therefore, we must focus our efforts at the organizational level, where economic impact can occur. Organizations – primarily private firms, supported by ministries and/or NGOs – are where economic value is created" (p. 24)

The World Bank has offered evidence to show that use of ICT provides economic benefits to firms in developing countries (World Bank, 2006). It states that with regard to developing countries, “firms that use ICT grow faster, invest more, and are more productive and profitable than those that do not” (p. 5). It also presents the analysis shown in Table 2-1 below, to support this claim. The table shows that in developing countries, on average, enterprises that use ICT outperform enterprises that don’t on each of 5 indicators identified. The analysis was based on the World Bank Investment Climate Surveys 2000–2003.

Table 2-1: Effect of ICT use on Enterprise Performance in Developing Countries

Indicator	Enterprises that do not use ICT	Enterprises that use ICT	Difference
Sales growth (percent)	0.4	3.8	3.4
Employment growth (percent)	4.5	5.6	1.2
Profitability (percent)	4.2	9.3	5.1
Labour productivity (value added per worker, dollars)	5,288	8,712	3,423
Total factor productivity (percent)	78.2	79.2	1.0

Source: World Bank (2006) p.5

There is very little data available on firm-level IT use within the Caribbean on which to base an empirical assessment of the extent to which firms are taking advantage of the potential of IT. The World Bank, which currently is one of the main sources of empirical data, acknowledges this problem with regard to the member countries of the OECS (see Appendix A) and in explaining the methods used to collect data on ICT use within the OECS territories, reports that “there is very little rigorously collected firm-level data in the OECS” (World Bank, 2005b, p. 76).

CARANA Corporation (2002) conducted an assessment of Information and Communications Technology (ICT) in St Lucia, under contract from the United States Agency for International Development (USAID), as part of its Eastern Caribbean Information Communications Technology (ECICT) initiative financed by USAID. The assessment reported on 4 dimensions: (i) Pipes (ii) Public (iii) Private (iv) People. The “Private” component reported on the use of ICT by the private sector and the potential for development of ICT as an economic sector. The assessment, while not providing specific details on firm-level use, drew a general conclusion that the private sector in St Lucia was making only rudimentary use of ICT:

“Overall, businesses in St. Lucia primarily use ICTs for word processing, accounting functions, and routine administrative business processes. There is little use of ICTs for core business activities. Business use of technology is hampered by the shortage of expertise in hardware and system support and a lack of understanding about how ICTs can be utilized to increase competitiveness.” (p. 29)

There is also very little published academic research that rigorously evaluates firm level IT use and experiences in the Caribbean. Among the few exceptions are Chin et al (2004) who investigate IT governance issues in a multi-national firm operating in the Caribbean, and Wresch and Fraser (2006) who investigate barriers to the adoption of e-Commerce in Caribbean firms. The latter research was based on interviews conducted in 21 firms in 5 Caribbean nations.

It can be seen from the above discussions that despite the strong advocacy in favour of IT as a tool for improving the competitiveness of Caribbean countries and the evidence that governments and aid agencies are willing to invest in IT, there is very little attention paid to the use of IT by private sector firms that are not IT service providers. There is also very little empirical research available on which to base assessments of the extent of use of IT by private sector firms or the factors that may be preventing those firms from deriving the benefits that are so widely expected.

There is a large body of research that discusses the relationship between IT and business performance. This is discussed in Section 2.6. In the next section however, it is shown that the geographical and cultural context in which the research is conducted is also relevant.

2.5 IT and “Context”

Orlikowski (1992) uses a “structuralist” model of technology to interpret the results of a field study into the use of IT in a large multi-national software consulting company and uses that as a basis for arguing that the implementation of technology cannot be separated from the context in which it is implemented. Walsham (2001), takes the argument of specificity to a particular context further by arguing that to be successful, IT has to be “appropriated” by users and adapted, not just into a particular organizational context, but also into a particular social and cultural context.

Walsham makes the point that much of the development in IT has taken place in Western countries, and that systems are typically designed around Western approaches to work and decision-making. He illustrates the argument through various case studies highlighting IT implementations that did not bring about desired results in developing countries because assumptions about how it would be used proved to be incorrect.

Avgerou (2001) also discusses the issue of context and argues that it is of crucial importance that information systems (IS) research and practice associates technology innovation with the context within which it is embedded. She further argues that “such analysis is particularly relevant for countries that pursue ICT-based development planning under the perceived imperatives of the global economy and by emulating other regions’ successful techno-economic policies” (p. 60). This argument is particularly relevant to Caribbean countries seeking to emulate benefits derived from IT in other countries.

Veiga et al (2001), explore the potential effect of national culture on technology acceptance along 4 dimensions derived from Hofstede’s work (Hofstede, 1980; Hofstede and Bond, 1988). The four dimensions used by Veiga et al (2001) were Individualism - Collectivism, Uncertainty Avoidance, Power distance and Long-term vs Short-term Orientation. The study proposed a “culturally sensitive” model of technology acceptance by proposing modifications to the Technology Acceptance

Model (Davis, 1989), to reflect the effect of the four dimensions of culture. The potential effects of culture are posited as a total 16 hypotheses.

Musa (2006) also proposes an adaptation to the Technology Acceptance Model (TAM), focusing on Davis et al (1989), to take account of more limited availability of IT in developing countries than in the countries where the models were developed. He argues that the TAM may be unsuited to developing countries because it was developed under the premise that technology is readily available and that this premise is not valid in some developing countries, particularly those of sub-Saharan Africa, because it assumes the onus of accepting or rejecting resides with the end-user. Musa proposes the addition of two factors to the TAM to take account of this situation: (a) "Accessibility of Technology to Individual" and (b) Individual's Perception of Socioeconomic Environment.

Given the above arguments about the importance of context and the peculiarities of the Caribbean business environment as discussed in Section 2.3, there is a need for Caribbean-specific investigation of IT at the firm level. In particular, it is necessary to determine how Caribbean firms are using IT, what benefits they are deriving, and why they may not be deriving the expected benefits. As pointed out earlier, there is little evidence of such Caribbean-specific research. Also, in a literature review of research on "IT in Developing Countries", Walsham and Sahay (2006) identify literature specific to several geographic regions of the world including South-East Asia, Africa, the Middle East and South America, but do not identify any literature that specifically addresses the Caribbean. The review was based on research published in 13 IS journals and 2 conference proceedings documents between January 2000 and May 2004.

The next section discusses how the literature points to the importance of firm-specific considerations in determining how IT contributes to business performance.

2.6 IT and Business Performance

Section 2.4 showed that IT was being promoted as providing a means for developing competitiveness in the Caribbean, and that these arguments had been influencing the policies and actions of government. Implicit in these arguments is the expectation that IT will improve the competitiveness of individual private sector firms, although there is very little discussion about how this will arise.

There has been a significant volume of literature debating the existence of a causal relationship between IT investment and business performance. During the 1990's much of this debate focused around the so-called "IT Productivity Paradox" issue. The main contention was that the large investments that had been made in computer technology in recent decades had not been shown to result in corresponding increases in productivity. Brynjolfsson (1993) provided an overview of some early literature of the issue and suggested: "it appears that the shortfall of IT productivity is as much due

to deficiencies in our measurement and methodological tool kit as to mismanagement of by developers and users of IT” (p. 67).

Much of the earlier research investigating the link between IT and business performance attempted to employ microeconomic or macroeconomic models using secondary data sources e.g. Hitt and Brynjolfsson (1996), Dewan and Kraemer (1998). However there was little consensus on the results and as Mahmood and Mann (2000) pointed out, even when the results of empirical analysis show a correlation between organizational performance and IT investment, there is still debate as to whether the correlation establishes causation.

Despite several articles on this topic over the years, the debate remained largely inconclusive. Chan (2000), in a literature review of 38 “IT-value” articles published in 4 “leading North American MIS journals” during 1993-1998, pointed to the apparent existence of a schism between researchers using quantitative vs those using qualitative (or “hard” vs “soft”) measures of IT value. Chan also suggested that the schism was deepening, further highlighting the lack of consensus in this debate.

More recently, discussion had moved away from whether general causal links can be established between IT and business performance and focused instead on how IT can contribute in specific circumstances. Dehning and Richardson (2002), in a synthesis of the research on “Return on Investment for IT”, state that by the late 1990s, “the question changed from “is there a payoff” to “when and why is there a payoff.” (p. 8)

There has also been increased interest in the effect of firm-specific characteristics in determining what value a firm derives from its IT investment. Brynjolfsson and Hitt (1998), acknowledge the importance of firm-specific factors by stating that “the greatest benefits of computers appear to be realized when computer investment is coupled with other complementary investment; new strategies, new business processes and new organizations all appear to be important in realizing the maximum benefits of IT”. (pp. 50-51). One of the firm-specific considerations that has received particular attention is the role of management, and the need for management to take a pro-active rather than passive role in ensuring achievement of expected IT benefits.

Ward et al (1996) reports on a survey of UK industry practices in the evaluation and realization of IS/IT benefits. The overall process is termed “benefits management”, which the authors define as “the process of organizing and managing such that potential benefits arising from the use of IT are actually recognized” (p. 214). The authors outline a process model of “benefits management” which includes the following elements:

- Identifying and structuring benefits
- Planning benefits realization
- Executing the benefits realization plan
- Evaluating and reviewing results
- Identifying potential for further benefits.

Ward et al argue that if benefits are to be derived from IS/IT through business changes, then it is reasonable to assume that the implications of these changes must be assessed pre-project in order to quantify the potential benefits. Also, it is the effects of these changes that must be evaluated post-project in order to determine if the desired benefits have been achieved in practice. The authors concluded that although most respondents expressed confidence that IS/IT was delivering benefits to their organizations, further analysis of the responses revealed little grounds for this confidence

Davern and Kauffman (2000) deal with the question of how potential value of an IT investment is turned into realized payoff for the organization. They use the term “conversion contingencies” to help explain the relationship between potential value and realized value of an investment. Conversion contingencies refer to the factors that affect whether the anticipated value can be realized from the investment. Some contingencies (e.g. management involvement and support, staff training and operational procedures) are internal and largely controllable by the firm whereas others (e.g. competitors’ actions, emergence of new technologies) are external and not controllable. They also introduce the term “locus of value”, which they attribute to Kauffman and Weil (1989). The locus of value is the primary level of analysis at which flows of IT value become discernable for the organization. This may be quite different from the level at which the potential value was realized and according to the authors, “confounds efforts among researchers and practitioners alike to portray accurately how IT investments pay off”.

Markus and Benjamin (1997) discuss the determinants of success in IT-enabled organizational change and claim that many large-scale change management projects involving new IT fail for reasons unrelated to technical feasibility and reliability. They also claim that good technology “implementation” and “change management” techniques can substantially increase the chances of success. They attribute many of the failures referred to above to the “Magic Bullet Theory” – the expectation that somehow IT by itself will bring change without individuals within the organization taking specific actions to promote or facilitate this change.

Markus and Benjamin (1997) identify two possible roles for IT-enabled change agents - "IT change facilitator" and "IT change advocate". The Change Facilitator role is equated with the typical role of organizational development consultants. The authors argue however that the Change Agent role can be played by people in a wide range of positions within the organization, including IT specialists.

One theoretical framework that offers a basis for relating the internal characteristics of a firm to the benefit that it derives from IT is the Resource Based View (RBV). This is discussed in the following section.

2.7 The Resource Based View and IT Value

2.7.1 Overview

Various authors, among them Penrose (1958), Rumelt (1984) and Wenerfelt (1984) are credited with contributing to the development of the theoretical underpinnings of the Resource-based View (RBV). Makadok (2001a) states that the RBV was “gradually assembled in a piecemeal fashion in four articles over the course of a decade”. He identifies those articles as Wernerfelt (1984), Barney (1986, 1991) and Peteraf (1993). (p. 498). Much of the work on RBV appearing in recent research however, including IS research, is based on the formulation of the RBV proposed by Barney (1991).

The key assertion, as formulated by Barney (1991), is that firm resources that are heterogeneous and imperfectly mobile will lead to sustained competitive advantage if they are valuable, rare, imperfectly imitable and non-substitutable (referred to as “VRIN” attributes by Eisenhardt and Martin, 2000, p. 1105). Barney explains the importance of these attributes as follows:

"To have this potential, a firm resource must have four attributes: (a) it must be valuable, in the sense that it exploits opportunities and/or neutralizes threats in a firm's environment, (b) it must be rare among a firm's current and potential competition, (c) it must be imperfectly imitable, and (d) there cannot be strategically equivalent substitutes for this resource that are valuable but neither rare or imperfectly imitable" (p. 105)

In discussing the characteristics of the RBV, Barney (1991) points out that much of the prior research on competitive strategy had been based on “environmental models” – models that focused on the impact of a firm’s environment on its competitive position, while paying little attention to the impact of idiosyncratic firm attributes on a its competitive position. One of the main proponents of environmental models was Porter (1980, 1985). The RBV, unlike the environmental models, linked a firm’s internal characteristics directly to its performance.

The RBV has since become very influential in the strategic management literature. As a simple indication of its influence, a search for peer-reviewed articles with the keyword “resource based view” in the EBSCOHost *Business Source Premier* database (<http://search.epnet.com>) at 15 July 2006, returned 522 article citations. Of these, 54 had publication dates in 2006.

It should be noted that the RBV is sometimes referred to in the literature as “Resource-based theory” (RBT) (e.g. Peppard and Ward, 2004). The status of the RBV as a theory has been challenged and the articulation of some of its concepts and constructs have been debated in the literature. Among these were debates involving Priem and Butler (2001a, 2001b) and Barney (2001); Foss and Knudsen (2003) and Peteraf and Barney (2003), and more recently, Gibbert (2006a, 2006b) and Levitas and Ndofor (2006).

A review of the arguments in these debates is outside the scope of this discussion. It should be pointed out however, that while Priem and Butler (2001a, 2001b), Foss and Knudsen (2003) and Gibbert (2006a, 2006b) question the formulation of the RBV as a theory and identify the need for improvements, they nonetheless agree that it provides a useful tool for analysis of competitive advantage. Further, an extensive search of both the conceptual and empirical literature on RBV did not identify any research that challenged the overall validity of the RBV arguments. As such, even if these challenges to the formulation of the RBV as a theory are valid, they do not negate its value as a basis for the analysis used in this document. In order to avoid digression to the question of whether or not RBV fully qualifies as a theory, and for consistency, the term “resource based view” or “RBV” is used exclusively in this document, except where the work of other authors is being quoted.

2.7.2 Use of RBV in IS Research

The RBV is also being used increasingly in IS research, and has been shown to provide a useful framework for investigating the relationship between IT and firm competitiveness. Several authors have used RBV as a basis for studying or explaining the relationship between IT and firm performance or firm competitiveness. Among them are Bharadwaj (2000), Bhatt and Grover (2005), Caldeira and Ward (2003), Mata et al (1995), Melville et al (2004), Peppard and Ward (2004), Piccoli and Ives (2005), Powell and Dent-Micallef (1997), Ravichandran and Lertwongsatien (2005), Ray, Barney and Muhanna (2004), Ray, Muhanna and Barney (2005), Santhanam and Hortono (2003), Tanriverdi (2005, 2006) and Wade and Hulland (2004). These include both conceptual (e.g. Mata et al, 1995; Peppard and Ward, 2004) and empirical studies (e.g. Powell and Dent-Micallef, 1997; Bharadwaj, 2000; and Ravichandran and Lertwongsatien, 2005). A selection of these studies that illustrate the use of RBV in IS research are discussed below.

Mata et al (1995), for example, used RBV logic in a conceptual analysis of IT as a potential source of sustained competitive advantage. The authors concluded that of 4 IT attributes examined - access to capital, proprietary technology, technical IT skills and managerial IT skills - only managerial IT skills provides a source of sustainable competitive advantage since the advantages provided by each of the others were shown to be easily imitable. Powell and Dent-Micallef (1997), in a widely-cited empirical study on the use of IT in the retail industry, concluded that IT alone did not produce sustainable performance advantages, but that some firms have gained advantages by using IT to leverage intangible, complementary human and business resources such as flexible culture, strategic planning–IT integration, and supplier relationships.

More recently, Ravichandra and Lertwongsatien (2005) used the RBV to develop a research model that interrelates IS resources, IS capabilities, IT support for core competencies, and firm performance. The model was tested empirically through a survey of 119 "Fortune 1000" firms in the US. The authors claimed that the results provide strong support for the research model and suggest that variation in firm performance is explained by the extent to which IT is used to support and enhance a

firm's core competencies. The results also support the proposition that an organization's ability to use IT to support its core competencies is dependent on IS functional capabilities which, in turn, are dependent on the nature of human, technology, and relationship resources of the IS department.

Given the increasing use of the RBV in IS research, some authors have found it useful to review and consolidate the various perspectives emerging from the literature. Melville et al (2004) and Wade and Hulland (2004), provide extensive reviews of the literature on the use of the RBV to examine the relationship between IT and firm performance or competitiveness, from different perspectives, with a view to synthesizing current knowledge into coherent models. Piccoli and Ives (2005) also provide a review of the literature on "IT-dependent strategic initiatives and competitive advantage". While the Piccoli and Ives review was not explicitly focused on the RBV, it covered several RBV-related papers and uses several RBV concepts in deriving a framework on how IT-dependent strategic initiatives contribute to competitive advantage.

Melville et al (2004) allude to the "uncertainty and debate about what we know and don't know" (p. 283) with regard to how IT contributes to organizational performance and argue that studies examining the relationship between IT and organizational performance are divergent in how they conceptualize key constructs and their interrelationships. The authors proceed to use the RBV as the basis for developing a model of IT business value that integrates the various strands of research into a single one. They further use the model to synthesize "what is known about IT business value" (p. 283) and guide future research by developing propositions and suggesting a research agenda.

The model proposed by Melville et al (2004) comprises 3 domains: (1) the *focal firm* – (the firm that deploys the IT resources) (2) the *competitive environment* and (3) the *macro environment*. Constructs related to each of these domains are then identified. Melville et al review more than 200 IT business value articles and using the model, derive five research questions pertaining to the 3 domains. Further, the authors attempt to answer the questions in the form of propositions.

Wade and Hulland (2004) review several studies on RBV in IS research, in an effort to critically evaluate use of RBV for IS research. The review covers at least 24 studies, published between 1991 and 2003. The authors offer a typology of IS resources, based on the work of Day (1994) that categorize IS capabilities (defined as a subset of the firm's resources) into 3 types of processes: *outside in*, *inside out* and *spanning*. They then use this categorization as the basis for classifying 8 key IS resources derived from previous research.

Piccoli and Ives (2005) explore the notion of "IT dependent strategic initiatives" and use it to frame a review of the literature on sustainability of competitive advantage, rooted in information systems use. The study included an extensive review of the literature on RBV, covering the abstracts of 648 articles drawn from information systems, strategic management, and marketing literature as well as detailed review of

a subset of 117 of those articles. Piccoli and Ives address the issue of how IT contributes to sustained competitive advantage by focusing on 4 “barriers to erosion” of IT-dependent strategic initiatives. These are IT resources barrier, Complementary resources barrier, IT Project barrier and preemption barrier.

The RBV offers a suitable theoretical basis for the research reported in this thesis, particularly for that reported in Chapter 5. Firstly, it provides a theoretical framework within which to explore the relationship of IT to firm competitiveness, by focusing on the internal characteristics of the firm, as opposed to environmental conditions. This allows it to be used as a means of focusing on issues within the control of the firm’s management. Secondly, it is sufficiently flexible to be combined with other theoretical concepts. For example, Spanos and Lioukas (2001) and Rivard et al (2006) both combine the RBV with Porter’s (1980) environmental model in empirical research.

Thirdly there is good precedent to the RBV being used as a basis for empirical research in IS literature that is relevant to the research being reported here. For example, Javenpaa and Leidner (1998) applied RBV to explore how a firm in a developing country (Mexico) responded to increased foreign competition in the local market. Also, Powell and Dent-Micallef (1997) used the RBV to investigate IT use in the retail industry and Tanriverdi (2005, 2006) used the RBV to study the issue of “IT synergies” in multi-business firms.

There are several variations however, in the way the RBV concepts are used in the literature. This poses a challenge in determining how best to operationalize the RBV for empirical research. This is discussed in the next section.

2.7.3 RBV concepts and definitions

One of the difficulties in using the RBV as a basis for empirical analysis lies in clarifying the various concepts and constructs. As shown below, there are several ways in which the concepts and constructs are articulated and interpreted, and how they are operationalized in the empirical literature. Peppard and Ward (2004) highlight this problem when they state there is “a lack of precision in the usage of the terms and concepts surrounding RBT and the literature is replete with often mutually contradictory definitions” (p. 174).

The definition of “resources” – one of the fundamental concepts of the RBV, is one of the areas of inconsistency. Wade and Hulland (2004) point out that “one of the key challenges RBV theorists have faced is to define what is meant by a resource” (p 108.). In different RBV studies, IS resources have been identified and classified in different ways. Barney (1991) offers a very broad definition of firm resources that includes "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive and implement strategies that improve its efficiency and effectiveness" (p. 101). He adds that "in the language of traditional strategic analysis, firm resources are strengths that firms can use to conceive of and implement their strategies". Wade and Hulland (2004) define

resources as "assets and capabilities that are available and useful in detecting and responding to market opportunities or threats" (p. 109). They further state that "Assets are defined as anything tangible or intangible the firm can use in its processes for creating, producing, and/or offering its products (goods or services) to a market, whereas capabilities are repeatable patterns of actions in the use of assets to create, produce, and/or offer products to a market".

Some of the definitions used in current literature tend to be narrower however, and many authors, following Amit and Schoemaker (1993), make a distinction between *resources* and *capabilities*. Amit and Schoemaker define *resources* as "stocks of factors owned or controlled by the firm" while *capabilities* refer to "a firm's capacity to deploy Resources, usually in combination with organizational processes that are firm-specific and are developed over time through complex interaction among the firm's Resources" (p. 35).

Makadok (2001b), uses Amit and Schoemaker's distinction in a synthesis of the RBV and the "dynamic capabilities" view or rent creation. Makadok discusses two mechanisms – *resource picking* and *capability building* - that have been proposed in the strategic management literature for understanding how managers create rent for the firms. The resource picking arguments assert that firms create economic rent by being more effective than their rivals at selecting resources while the capability building arguments assert that firms create economic rent by being more effective than their rivals at deploying resources. Makadok suggests that the resource picking mechanism is closely associated with the RBV perspective while the capability building mechanism is more closely associated with the *dynamic capabilities* perspective (e.g. Teece et al, 1997). He elaborates on Amit and Schoemaker's distinction by pointing out two key features that distinguish a capability from other types of resources: firstly, that a capability is firm-specific since it is embedded in the organization and its processes, while an ordinary resource is not, and secondly, that the primary purpose of a capability is to enhance the productivity of the other resources that the firm possesses. He nonetheless goes on to state that "for the purposes of this paper, a capability is defined as a special type of resource" (p. 369).

It should be noted that some authors do not consider the dynamic capabilities perspective to be a distinct perspective from the RBV. For example, Peteraf and Barney (2003) refer to the "dynamic capabilities version of the RBT" (p. 312) while Melville et al (2004) refer to the "dynamic capabilities extension of the RBV" (p. 313). Also, Eisenhardt and Martin (2000), sought to use the "dynamic capabilities" perspective to "enhance" the RBV to make it more applicable to dynamic markets.

Another concept used in some RBV-related studies is "competencies" (e.g. Ravichandran and Lertwongsatien, 2005, Rivard et al, 2006). These authors use the term "competencies" in a manner similar to the way others have used the term "capabilities". None of these two papers offer a specific definition of "competence" however, although Ravichandran and Lertwongsatien (2005) base its use on Hamel's (1994) work on "core competencies".

Not all authors are convinced of the importance of clear distinctions between the above terms, however. Ray et al (2005) for example, state:

“A variety of labels (inputs, assets, capabilities, competencies) have been used to describe a firm’s resource endowments. The label is not critical in this context. What is important is identifying resources that are likely to be sources of competitive advantage”. (p. 627).

Also Bhatt and Grover (2005) state “We use the terms capabilities and competencies interchangeably. Although some purists would take issue with this, we do not believe parsing these terms is useful for this study”. (p 274). Wade and Hulland (2004) argue that:

“... we view the terms capabilities, competencies, and core competencies as essentially synonymous. According to Sanchez et al. (1996), the only difference between these terms lies in the fact that core competencies are capabilities that achieve competitive advantage. Because we explicitly discuss only capabilities that lead to superior performance, in this paper the terms can be considered interchangeable”. (p. 109).

Some authors implicitly assume that the meaning of “resource” is understood and do not explicitly define it. For example, although Bhatt and Grover (2005) use the terms “resource” and “capability” extensively, they do not define either. Also, Melville et al (2004) develop a model of “IT Business Value” based on the RBV that offers a categorization of resources, but does not explicitly define what a resource is.

Table 2-2 below shows a summary of some recently published RBV-based IS research, highlighting the concepts and definitions used. The summary focuses on recent literature (published between 2004 and 2006). These papers provide a good representation of the different uses and formulation of the RBV in IS research, particularly since the list includes 3 extensive literature reviews (Melville et al, 2004; Piccoli and Ives, 2005; Wade and Hulland, 2004). The summary also includes some of the recent empirical literature on the use of RBV in IS published in some of the most respected journals

The selection of research shown in Table 2-2 illustrates the variations in the way the RBV is used, as discussed above. In Section 5.4, I explain how I synthesize this literature and use it in conjunction with other theoretical concepts to derive an analytical framework for the research. Specifically, in Section 5.4.2.1 revisit the definition of “resources” and explain the definition chosen for the research.

The next section discusses the concept of *inhibitors* and their potential effect in preventing a firm from deriving the expected benefits from IT.

Table 2-2: Summary of Recent RBV Literature

Authors/ Type of research	Overview and Main Findings/ Conclusions	Characterization of Resources and main constructs
<p>Bhatt and Grover (2005). Empirical. Uses mail survey of chief IT executives of 202 manufacturing firms in the US</p>	<p>Discusses types of IT capabilities and their role in creating competitive advantage for firms. Identifies 4 perspectives of competitive advantage and chooses the RBV as the framework for the study.</p> <p>Makes a point of rebutting Carr’ (2003) arguments that “IT does not matter”, to the point of referring to them as “dangerous”.</p> <p>Main conclusions: Support the argument that the 3 types of capabilities identified – <i>value capabilities</i>, <i>competitive IT capabilities</i> and <i>dynamic capabilities</i> - are antecedents to competitive advantage of the firm. Contrary to arguments elsewhere in the literature, results demonstrate a lack of significance between quality of IT infrastructure and competitive advantage</p>	<p>Value capabilities - capabilities that have value but do not provide competitive advantage</p> <ul style="list-style-type: none"> • IT Infrastructure <p>Competitive IT capabilities - are valuable, heterogeneously distributed and difficult to transfer</p> <ul style="list-style-type: none"> • IT Business experience • Relationship infrastructure <p>Dynamic capabilities - allow organizations to respond to changes in the environment</p> <ul style="list-style-type: none"> • Intensity of organizational learning

Authors/ Type of research	Overview and Main Findings/ Conclusions	Characterization of Resources and main constructs
<p>Melville et al (2004). Conceptual /Literature Review. (States that 202 articles were identified in the search but does not state how many individually reviewed).</p>	<p>The stated objectives of the review are to (1) develop a model of IT business value based in theory and informed by existing IT business value research; (2) use the model to synthesize what is known about IT business value; and (3) guide future research by developing propositions and putting forward a research agenda. Main conclusions: Derives a model with 3 <u>domains</u> to show how phenomena resident in each domain shapes the relationship between IT and firm performance. Domains are: (a) Focal firm (b) competitive environment and (c) Macro environment. Uses the model to identify 5 research questions corresponding to the 3 domains and derives 11 propositions addressing the questions.</p>	<p>IT Resources:</p> <ul style="list-style-type: none"> • <i>Technological IT resource (TIR)</i>. Categorized into (1) IT infrastructure, i.e., shared technology and technology services across the organization, and (2) specific business applications that utilize the infrastructure, i.e., purchasing systems, sales analysis • <i>Human IT resource (HIR)</i>. Denotes both technical and managerial skills for implementing and supporting IT. <p>Complementary Organizational Resources. – Other firm resources that provide synergies with IT resources. Includes non-IT physical capital resources, non-IT human capital resources, and organizational capital resources</p> <p>Business Processes – “the specific ordering of work activities across time and space, with a beginning, an end, and clearly identified inputs and outputs.”</p> <p>Performance</p> <ul style="list-style-type: none"> • <i>Business Process Performance</i>. Operational efficiency of specific business processes • <i>Organizational Performance</i>. Overall firm performance, including productivity, efficiency, profitability, market value, competitive advantage, etc.

Authors/ Type of research	Overview and Main Findings/ Conclusions	Characterization of Resources and main constructs
Peppard and Ward (2004). Conceptual.	<p>Draws on RBV to develop a concept of IS capability. The model relates IS capability to firm performance. The paper alludes to the inconsistencies in the definition of key constructs of the RBV and offers specific definitions of resources, capabilities and competencies.</p> <p>Also proposes a conceptual model relating the following constructs to Organizational Performance:</p> <ul style="list-style-type: none"> • IS/IT strategy • Business Strategy • IT Operations/ Services • Business Operations • IS Capabilities • IS Competencies 	<p>Definitions:</p> <p><i>Resources</i> – “stocks of available factors that are owned or controlled by the firm”.</p> <p><i>Competence</i> – “a firm’s capacity to deploy resources, usually in combination, using organizational processes, to effect a desired end”.</p> <p><i>Capability</i> – “the strategic application of competencies”</p> <p>Identifies 26 competencies from prior literature. This is divided into 6 domains:</p> <ul style="list-style-type: none"> • Formulate strategy • Define the IS contribution (IS strategy) • Define the IT capability (IT strategy) • Exploitation • Deliver solutions • Supplier relationships

Authors/ Type of research	Overview and Main Findings/ Conclusions	Characterization of Resources and main constructs
<p>Piccoli and Ives (2005). Conceptual/ Literature review. Review a subset of 117 articles from a list of 648 articles identified from search.</p>	<p>Reviews the literature on “IT-dependent” strategic initiatives and offers an integrative model.</p> <p>Main conclusions: Development of an integrative model summarizing the determinants of sustainability of competitive advantage rooted in information systems use.</p> <p>Main constructs are “Barriers to Erosion” – resources that prevent erosion of competitive advantage. These are identified as IT Resources Barrier, Complementary Resources Barrier, IT Project Barrier and Preemption Barrier. For each barrier, specific “response lag” drivers are identified. These for the most part, correspond to “resources” in other RBV studies.</p>	<p><i>IT Resources Barrier</i> <i>Response Lag drivers:</i></p> <ul style="list-style-type: none"> • IT Assets <ul style="list-style-type: none"> ○ IT infrastructure ○ Information repositories • IT Capabilities <ul style="list-style-type: none"> ○ Technical skills ○ IT management skills ○ Relationship asset <p><i>Complementary Resources Barrier - Response Lag drivers:</i></p> <ul style="list-style-type: none"> • Complementary Resources <p><i>IT Project Barrier</i> <i>Response Lag drivers:</i></p> <ul style="list-style-type: none"> • Technology Characteristics <ul style="list-style-type: none"> ○ Visibility ○ Uniqueness ○ Complexity • Implementation Process <ul style="list-style-type: none"> ○ Complexity ○ Process change <p><i>Preemption Barrier</i> <i>Response Lag drivers:</i></p> <ul style="list-style-type: none"> • Switching Costs <ul style="list-style-type: none"> ○ Tangible co-specialized investments ○ Intangible co-specialized investments ○ Collective switching costs • Value System Structural Characteristics <ul style="list-style-type: none"> ○ Relationship exclusivity ○ Concentrated links

Authors/ Type of research	Overview and Main Findings/ Conclusions	Characterization of Resources and main constructs
<p>Ravichandran and Lertwongsatien, (2005). Empirical. Based on survey of 119 “Fortune 1000” firms in the US.</p>	<p>Develops a model that interrelates four constructs: firm performance, IT support for core competencies, IS capabilities, and IS resources. Develops 3 hypotheses on the nature of the relationships, and tests via a survey.</p> <p>Main conclusions: Concludes that the results provide empirical support for the notion that IS has the potential to improve firm performance when its capabilities are channeled to develop distinctive firm competencies. Also that results highlight the “path and time” dependencies involved in using IT in pursuit of firm strategies - organizations that have successfully used IT to gain competitive advantage have been able to do so because of a history of choices about the acquisition and deployment of IS resources.</p>	<p>IS Human Capital</p> <ul style="list-style-type: none"> • IS Personnel Skill • IS Human Resource specificity <p>IT Infrastructure Flexibility</p> <ul style="list-style-type: none"> • Network and Platform Sophistication • Data and Applications Sophistication <p>IS Partnership Quality</p> <ul style="list-style-type: none"> • Internal Partnership Quality • External Partnership Quality <p>IS Capabilities</p> <ul style="list-style-type: none"> • IS Planning Sophistication • Systems Development Capacity • IS Support Maturity • IS Operations Capability <p>IT Support for Core Competencies</p> <ul style="list-style-type: none"> • IT Support for Market Access Competency • IT Support for Integrity-related Competency • IT Support for Functionality-related Competence

Authors/ Type of research	Overview and Main Findings/ Conclusions	Characterization of Resources and main constructs
<p>Ray et al (2005). Empirical. Based on survey of 104 firms in life and health insurance industry in North America.</p>	<p>Presents a study that examines the extent to which IT impacts customer service and investigates the differential effects of various IT resources and capabilities on the performance of the customer service process across firms that compete in the North American life and health insurance industry.</p> <p>Main conclusions: Suggests that tacit, socially complex, firm-specific resources explain variation in process performance across firms and that IT resources and capabilities without these attributes do not. Also makes a distinction between absolute performance effects – improvements obtained by using the IT resource for a particular process compared to executing the process without it and relative effects – improvements obtained by using the IT resource, compared to the competitor.</p>	<p>Technical IT Skills - general, explicit skills (e.g., programming), possessed by the firm’s IT staff that are needed to develop IT applications.</p> <p>Generic Information Technologies. - set of well known hardware and software technologies that can be purchased from outside suppliers</p> <p>IT Spending - The level of raw dollar spending on IT</p> <p>Shared knowledge - conjunction of IT and business-related knowledge possessed by and exchanged among the IT and line managers.</p> <p>Flexible IT Infrastructure - IT Infrastructure that enables the organization to respond swiftly to take advantage of emerging opportunities or to neutralize competitive threats. IT Infrastructure defined as a shared set of capital resources that provide the foundation on which specific IT applications are built. The primary constituents are (1) computing platform (hardware and operating systems), (2) communications network, (3) critical shared data, and (4) core data processing applications.</p>

Authors/ Type of research	Overview and Main Findings/ Conclusions	Characterization of Resources and main constructs
<p>Rivard et al (2006). Empirical. Based on survey of 96 SMEs in Quebec, Canada.</p>	<p>Aims to improve the understanding of the contribution of IT to firm performance. Uses the work of Spanos and Lioukas to build on the complementarity between RBV and the “strategic positioning” perspective. Develops a model that encapsulates the effects of both IT support for business strategy and IT support for firm assets on performance. The model is tested through a survey of 96 SMEs. Main constructs were Industry Forces, IT Support for Strategy and IT support for Firm assets. Performance was deemed to have two components: Market Performance and Profitability.</p> <p>Main conclusions: Results reinforce the strategic importance of the roles played by IT in explaining business performance. IT support plays two critical roles in terms of competitive strategies (1) when aligned with the firm’s competitive strategies IT contributes to market performance and (2) when used to leverage firm capabilities, IT have both an indirect and a direct effect on performance. Indirect effect in that IT may contribute to fostering the formulation and the implementation of competitive strategies that impact market performance. When they are used to support the firm’s valued assets, IT has a direct effect on profitability.</p>	<p><i>IT Support for Strategy</i></p> <ul style="list-style-type: none"> • IT support for innovative differentiation • IT support for marketing differentiation • IT support for low cost <p><i>IT Support for Firm Assets</i></p> <ul style="list-style-type: none"> • IT support for organizational competencies • IT support for marketing competencies • IT support for technological competencies <p><i>Market Performance</i></p> <ul style="list-style-type: none"> • Annual revenue • Growth in revenue • Market share • Growth in market share <p><i>Profitability</i></p> <ul style="list-style-type: none"> • Profit margin • Return on investments • Financial liquidity

Authors/ Type of research	Overview and Main Findings/ Conclusions	Characterization of Resources and main constructs
<p>Wade and Hulland (2004). Conceptual/ Literature Review. Based on 24 conceptual and empirical studies.</p>	<p>Argues that while RBV has been used on a number of occasions in IS research, there has been no comprehensive effort to describe or defend its use in an IS context. Reviews prior literature on RBV, particular in IS-related studies and offers a number of propositions. Proposes a categorization of IS resources into 3 categories – Outside In, Inside Out and Spanning.</p> <p>Main conclusions: Develops a set of 14 propositions to explain the effect of specific resource attributes on both short-term and long-term competitive position. Also confirms that the RBV is a useful tool for understanding how particular parts of the firm affect the firm at large. In particular, the RBV provides a way for IS researchers to understand the role of IS within the firm and to compare that on equal terms with other firm resources to eventually form an integrated understanding of long-term firm competitiveness.</p>	<p>Outside In:</p> <ul style="list-style-type: none"> • External relationship • Market responsiveness <p>Inside Out:</p> <ul style="list-style-type: none"> • IS infrastructure • IS technical skills • IS development • Cost effective IS operations <p>Spanning:</p> <ul style="list-style-type: none"> • IS-business partnerships • IS planning and change management

Source: Compiled by Author.

2.8 Role of “Inhibitors”

King and Teo (1996) use a survey as well as existing literature to identify *facilitators* and *inhibitors* of strategic application of IT within business firms. Facilitators are defined as factors that positively influence the ability of an organization to exploit information resources or factors that positively influence an organization's decision to use IT applications for strategic purposes, while inhibitors are factors that negatively influence this ability or those decisions. For the purpose of their research, King and Teo considered inhibitors to be the negative of facilitators and therefore did not identify a separate set of factors as inhibitors. While noting there had been few empirical studies on facilitators and inhibitors, King and Teo pointed out that “inhibitors are studied even less frequently” (p. 36).

The view that inhibitors can simply be identified as the negative of facilitators has been challenged in more recent research. For example, in a study identifying inhibitors of "IT-Mediated Customer Service", Cenfetelli and Benbasat (2003) describe the view that "the antecedents of dissatisfaction are presumed to be the opposite of satisfaction" as "naive" (p. 282). The authors argue that failure to examine inhibitors may lead to the omission of important factors. Teo et al (2006) pointed out that previous research on E-commerce adoption commonly focused more on facilitators than inhibitors. They further stated that "a study of inhibitors is important as their effects might be different from the facilitators of an innovation" (p. 13). Cenfetelli (2004) also argues that “inhibiting and enabling perceptions are independent of one another and can coexist” (p. 472).

Within the IS-related RBV literature “facilitators” approximate very closely to some of the interpretations of “resources”. For example, Barney (1991) states that “resources” can be considered as “strengths” in the language of traditional strategic analysis. However, while the formulation of the RBV implies that resources that do not have the attributes of being valuable, rare, imperfectly imitable and non-substitutable will not contribute to the achievement of competitive advantage, there is hardly any explicit discussion about specific attributes of the IT used by firms or the way the IT is used that reduces the potential contribution of IT.

The above suggests that an understanding of the factors that inhibit a firm’s ability to derive benefits from IT is important if one is to derive recommendations on how to improve IT use. An explicit understanding of factors that reduce the ability of IT to make expected contributions to competitiveness would be useful for both academics and practitioners.

Very little of the available RBV-related research attempt to address inhibitors explicitly. Therefore, the concept of *inhibitors* will be used explicitly in the analysis of the data to identify specific reasons that the firm is not deriving the benefits that it could from its IT resources. For the purposes of this study, inhibitors are factors that reduce the firm’s ability to derive the potential benefits from its available IT

resources. Inhibitors have been included in the analytical framework derived in Section 5.4

2.9 Summary of Key Arguments

The following key arguments can be summarized from the literature review:

- Caribbean firms are facing increased competitive pressures, brought about by changes in the global economic environment, such as “globalization” and the reduction of trade barriers. There is an imperative for these countries and their businesses to become more internationally competitive. (e.g. CARICOM Secretariat, 2006; Fraser and Henry, 2007; OECS, 2000; Read, 2004; World Bank, 2005b, 2005d)
- A number of influential individuals and institutions have advocated for increased use of IT as a means of improving the competitiveness of Caribbean economies and firms. (e.g. Caribbean Development Bank, 2006b; McIntyre, 2000; Schware and Hume, 1996; St Lucia National Economic Council, 2005)
- There is evidence that some Caribbean governments have been sufficiently persuaded by these arguments to commit efforts and funds towards increasing the application of IT within their countries. (e.g. Government of Antigua and Barbuda, 2002; Government of Grenada, 2002; Government of St Lucia, 2005a)
- Many of the arguments for increased use of IT to improve competitiveness in the Caribbean are presented from a macroeconomic and policy perspective, rather than a firm-level or management perspective. However, even in the macroeconomic and policy discussions, there is acknowledgement that for IT to bring about the desired improvements, the impact must be made at the firm level (e.g. Infodev, 2005; World Bank, 2005b; World Bank, 2006).
- Within the “IT Value” literature stream, there is evidence that IT can contribute to improved firm performance. However, the literature has increasingly emphasized the importance of firm-specific factors, such as the role of management, in determining whether IT investments make the desired contributions. (e.g. Brynjolfsson and Hitt, 1998; Markus and Benjamin, 1997; Mata et al, 1995).
- Some authors have also emphasized the importance of the geographical and cultural context in which IT is deployed and used, in determining whether IT investments make the desired contribution. (e.g. Avgerou, 2001; Orlikowski, 1992; Veiga et al, 2001; Walsham, 2001).

The above arguments point to a need to empirically investigate the relationship between IT and competitiveness of firms within the Caribbean context. Thus far however, only a few examples have emerged of firm-level empirical research on the use of IT in the Caribbean. Given the dearth of rigorous firm-level empirical research on IT use in Caribbean countries compared to the high level of expectation

from investment in IT, it is necessary to develop a better understanding of whether and how IT is contributing to the competitiveness of firms in the Caribbean. The arguments also show the need for such research to address the link between IT and competitiveness of firms, while remaining well-grounded in the context (Caribbean SIDS) in which the research is being conducted.

2.10 Deriving the Research Questions

The RBV has been shown to be a suitable framework for research that aims to associate the internal characteristics of a firm to its performance and specifically, for relating the firm's resources and capabilities to its ability to achieve sustainable competitive advantage (e.g. Mata et al, 1995; Powell and Dent-Micallef, 1995). It has also been shown to be flexible and adaptable, in that it has been used in conjunction with other theoretical concepts (e.g. Spanos and Lioukas, 2001; Rivard et al 2006) and can be used where the issue of context is important (e.g. Javenpaa and Leidner, 1998; Melville et al, 2004).

In order to address the need for a better understanding of the relationship between IT and the competitiveness of Caribbean firms as discussed above from an RBV perspective, it is necessary to understand what IT resources the target firms have, how these resources are being used, and to what extent they are contributing to the competitiveness of the firms.

Thus a possible research question is "How are private sector Caribbean firms using Information Technology (IT) resources to assist in surviving the increasingly competitive business climate?"

As the analysis in Table 2-2 shows however, there are several concepts and constructs that have been found to be important in using the RBV framework empirically. The danger of focusing the research question narrowly on "resources" from the outset is that it may cause us to ignore other important considerations that are relevant to application of the RBV, and that would lead to a more complete understanding. Therefore, the research will be framed to consider the broader question of how the firms are using IT. Consequently, the first research question is as follows:

Research Question 1: How are private sector Caribbean firms using Information Technology (IT) to assist in surviving the increasingly competitive business climate?

The limited empirical evidence available from firms in the Caribbean (e.g. CARANA Corporation, 2002, Wresch and Fraser, 2006) suggests that they are not deriving the level of contribution from IT that would be expected. The RBV literature shows that firm-specific factors are the main determinants of the contribution that IT makes to firm competitiveness. However, the RBV literature does not explicitly identify what inhibitors would limit the contributions that can be derived. Such an understanding would be required for researchers and practitioners to be able to determine how to improve the level of contribution. Therefore, the second research question is:

Research question 2: What are the firm-specific factors limiting the contribution that IT can make to the competitiveness of the firms?

2.11 Positioning of the Research

The research draws primarily upon 3 streams of literature:

- The broad “IT Value” literature stream that address the question of whether and how IT contributes to firm performance
- The RBV that deals specifically with the application of firm resources to derive competitive advantage
- The “ICT4D” stream that deals with the contribution of IT to socio-economic development in Developing Countries.

It is being conducted within the context of firms in Caribbean “SIDS” (Brugulio, 1995; UNCTAD, 2004).

Thus the research aims to contribute to the nexus of these three streams, as shown in Figure 2-1 below. The contribution will focus specifically on the context of the Caribbean.

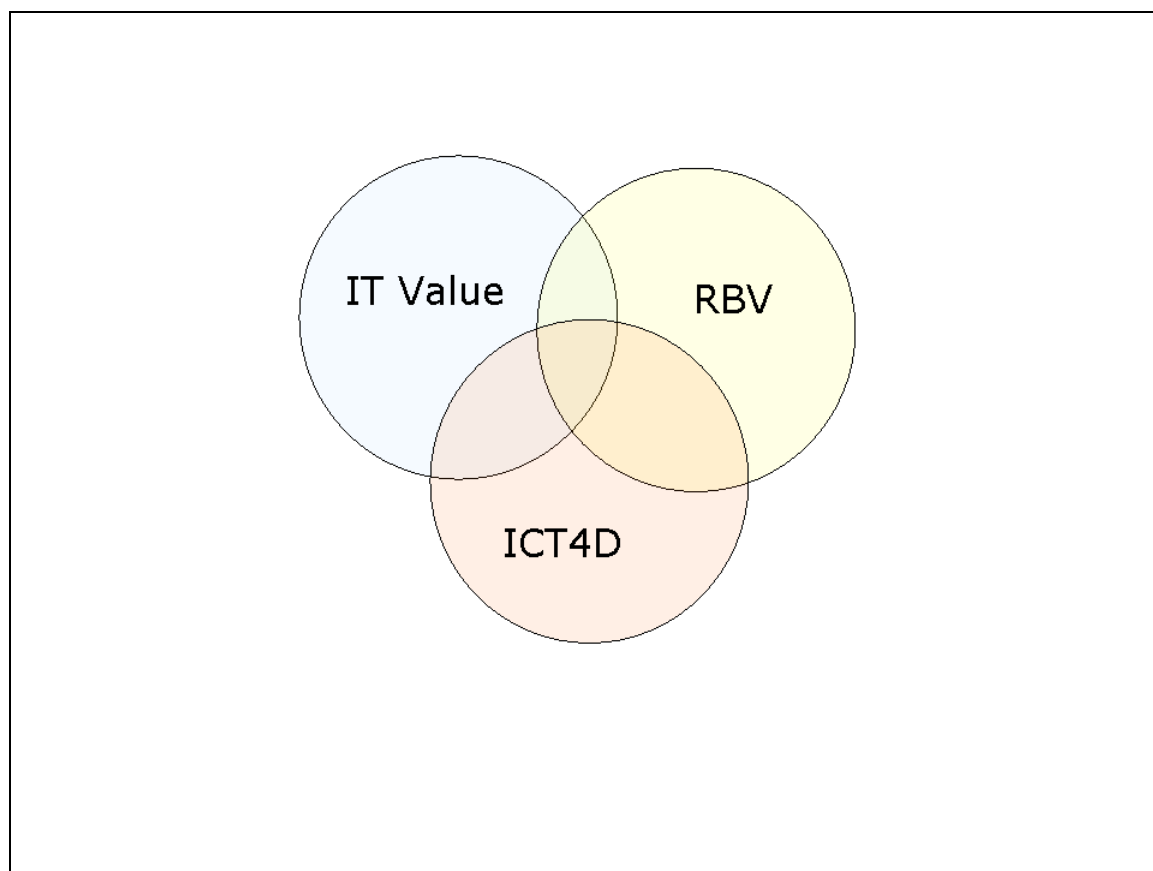


Fig 2-1 Positioning of the Research (Source: Compiled by author)

2.12 Chapter Summary

This chapter reviewed the streams of literature that formed the background to this research and informed the development of the theoretical framework. It considered how the development imperatives of the Caribbean SIDS have led the political decision-makers towards considering IT as a development. It also demonstrates however, that the empirical basis for these decisions is limited because of the lack of Caribbean-specific research.

In the next chapter, I described the overall methodology applied in executing the research.

CHAPTER 3: RESEARCH STRATEGY AND METHODOLOGY

3.1 Chapter Introduction

This chapter explains the strategy and methodology adopted for the research. Section 3.2 explains the overall philosophy that guided the approach to and design of the research. Section 3.3 discusses the choices made in the design of the research and why these were the most suitable, given the research philosophy and the environment in which it was being conducted. Sections 3.4 and 3.5 describes the methods for the actual execution of the research, with specific emphasis on the methods used to collect and analyse the data. Section 3.4 covers the data collection methods used while Section 3.5 explains the data analysis process. Finally section 3.6 explains the measures taken to ensure the quality of the research undertaken.

3.2 Research Philosophy and Approach

3.2.1 Research Philosophy

The research was conducted primarily from the *interpretive* perspective. Blaikie (1993) describes interpretivism as “an ontology in which social reality is regarded as the product or processes by which social actors together negotiate the meaning for the actions and situations” (p. 96). Within the interpretivist ontology, *social reality* is deemed to be constructed by the interpretations of the actors who are part of that reality. Walsham (1995) offers a more straightforward explanation of the interpretive stance – that “our knowledge of reality is a social construction by human actors” (p. 376).

Orlikowski and Baroudi (1991), reviewed 155 IS research articles published between 1983 and 1988 and found a dominance of positivism as the underlying epistemology, accounting for 96.8% of the studies reviewed. The authors contended that this dominance of a single set of philosophical assumptions was unnecessarily restrictive and argued that there were other philosophical assumptions that could inform studies of the relationships between people, information technology and organizations. They concluded that there was much to be gained from greater plurality of research perspectives, specifically identifying the interpretive and critical approaches as alternatives. Nandhakumar and Jones (1997), in a review of research articles published in 3 IS journals (2 American and 1 European) between January 1993 and December 1996, classified 160 of them as “positivist” as compared to 37 classified as “interpretive”.

Since the Orlikowski and Baroudi (1991) article however, other authors have pointed to evidence of increasing acceptance of interpretivism as a legitimate approach to information systems research (e.g. Klein and Myers, 1999; Nandhakumar and Jones, 1997, Tan and Hall, 2007 and Walsham, 1995). Walsham (1995) refers to a number of “solid bodies of work” adopting an interpretive stance in specific areas of IS research including systems design, organizational intervention and the management of IS. He

also points to evidence of changes in the policy, contents and types of journals reporting IS research, and a change in the “total dominance of a small number of orthodox journals with an explicit positivist philosophy” (p. 390). Klein and Myers (1999) point to the increasing acceptance of the interpretive stance as justification for proposing a set of principles for conducting and evaluating interpretive studies in the IS field.

A further illustration of the increasing acceptance of interpretive research in IS was the publication of a Special Issue on “Intensive Research” by *MIS Quarterly* (Markus and Lee, 1999), which was one of the journals identified in both the Orlikowski and Baroudi (1991) and Nandhakumar and Jones (1997) studies as being dominated by positivist and quantitative research. Markus and Lee (1999) conceded that “from its inception until quite recently, the academic information systems field has often been hostile to non-quantitative and non-positivist research”. (p. 37)

The decision to use an interpretive approach for my research has been driven more by pragmatic considerations about the nature of the problem to be investigated, the answers being sought, and the circumstances under which the research was being conducted, than by a philosophical commitment to the paradigm. The projects comprising the research reported in this thesis all investigate the relationship between IT and a firm’s competitive position, primarily from the perspective of the firm’s management. This meant that it was necessary to develop an understanding of the individual and collective views of management on the role of IT, and this was best elicited through an interpretive approach. This decision is consistent with the argument of Klein and Myers (1999) that “Interpretive research can help IS researchers to understand human thought and action in social and organizational contexts; it has the potential to produce deep insights into information systems phenomena including the management of information systems and information systems development.” (p. 67)

Also, use of an interpretive method helped to overcome some of the challenges of conducting firm-level empirical research in this environment. There is no established tradition of conducting and publishing empirical research at the firm level in the private sector in St Lucia (and the rest of the Caribbean). One of the reasons is the difficulty in getting "objective" data for such research. Most of the firms in this region are private, and generally do not disclose financial data except in fulfillment of legal obligations, such as taxation. There are very few listed companies, and in fact, at 15 July, 2006, the website of the Eastern Caribbean Securities Exchange (<http://www.ecseonline.com>), which is the sole securities exchange for St Lucia and five other eastern Caribbean countries with a combined population of just under 600,000, showed only 9 companies as being listed. Further, unlike what pertains in North America and Europe, there are very few sources of secondary data that can be used to compare firms.

In the absence of specific financial data that would allow one to derive measures such as level of investment in IT, profitability, return on assets, and return on investment, one has to rely on the managers of the firm to provide their views on the firm's

performance. Similarly, in the absence of data on the total value of a market, and competitors' sales, one is again reliant on the managers to provide their assessments of a firm's performance vis-a-vis its competitors.

The unwillingness of firms to disclose financial and other data that they consider sensitive (sometimes referred to as a "culture of secrecy") does not only affect potential academic researchers, but also other parties who have business relationships with the firm. It has been a frequent cause for complaints by trade unions who argue that they are disadvantaged during wage negotiations. It has also been cited as a possible inhibitor to the development of e-business in the Caribbean. Didar-Singh (2001), in a report of a study to determine the readiness for "e-business" in Caribbean countries, made reference to this problem. In the case of St Lucia for example, in response to an assessment question of "Is the institutional framework fostering culture of local creativity and information sharing within the society", the report stated:

"No policy towards this and therefore tradition of closed systems and secrecy in corporate culture especially continues." (p 118).

Similarly, in response to the same question for St Kitts – another eastern Caribbean territory, the report stated "Secrecy and non-sharing of information still traditional way of business. No institutional change underway." (p. 116)

3.2.2 Knowledge Production and the Research Context

Tranfield and Starkey (1998), draw on the work of Gibbons et al (1994), in discussing the distinction between "Mode 1" and "Mode 2" methods of knowledge production in the context of management research.

Mode 1 is described as following a the more traditional model, "whereby knowledge production occurs largely as a result of an academic agenda, predominantly driven through, and categorized by, associated adjacent disciplines, developing knowledge stocks largely residing in universities, guarded by 'elite gatekeepers'. In Mode 1 research there is a 'distinction between what is fundamental and what is applied'". (p. 347). In this model dissemination occurs downstream of knowledge production.

The *Mode 2* knowledge-production system, according to Tranfield and Starkey (1998) "requires trans-disciplinarity in which teamworking rather than heroic individual endeavour becomes the established norm". They also claim that "the Mode 2 system results in immediate or short time to market - dissemination and exploitation in that knowledge is produced in the context of application". (p. 347).

Tranfield and Starkey, while acknowledging some challenges with a Mode 2 approach (such as the danger of "epistemic drift" caused by pressures arising in practice) argue in favour of adopting this approach, on the basis that it offers "a different and potentially more appropriate (useful/relevant) model of the link between theory and practice" (p. 351). Other authors have weighed in on the debate, in some cases attempting to provide greater clarity on the characteristics and application of Mode 2 e.g. (Das, 2003; MacLean et al, 2002). Some of the advocates of Mode 2 research

however, e.g. Harvey et al (2002), MacLean et al (2002), seem to associate Mode 2 research with Action Research or other collaborative research methods.

The research reported in this thesis takes its direction from the work of Tranfield and Starkey (1998). It relies heavily on the knowledge of managers of target firms to build an understanding of the role of IT within these firms and in that respect is closer to Mode 2 than Mode 1 type research.

3.2.3 Research Project Structure

In keeping with the structure of the Cranfield Executive Doctorate (DBA) programme, the research was executed as a series of 3 related projects. An illustration of the 3 projects is shown in Figure 3-1.

- **Project 1** was an exploratory study that sought to establish perceptions and practices of IT use within the target firms. The research elicited and analyzed respondents' views on the actual and potential role of IT within their respective firms, with particular emphasis on the use of IT to support or strengthen their competitive positions. This project was designed to provide initial insights into the existing situation that would help set the direction for the continuation of the research.
- **Project 2** used the findings of Project 1 as a basis for an in-depth multi-case study of IT use within 3 business units of a single firm. The project used the existing literature to derive an analytical framework of the relationship between a firm's resources and contribution of IT to its competitiveness. It also used a data collection instrument derived from the results of Project 1. This allowed an initial list of inhibitors to IT use to be identified.
- **Project 3** further investigated the inhibitors identified in Project 2. For each of the inhibitors identified in Project 2, it investigated why they existed, their causes and effects and how the inhibitors related to each other. This was used to derive a model of inhibitors and their relationships. It was also used to determine how the identification of these inhibitors related to the published literature.

Projects 2 and 3 were closely related. The research for these two projects was driven by the same research questions and used similar approaches to data collection and analysis. While the planning, data collection and initial data analysis for the two projects were executed as separate activities, it proved more practical to present the design and results of the research as a single report, as this provided a more coherent account.

The same overall philosophy and methodology was used throughout the three projects. However, different approaches were used in Project 1, compared to Projects 2 and 3. Therefore, in the discussion that follows, the differences between the Project 1 methods and that of Projects 2 and 3 will be identified where necessary.

A summary of Project 1 is provided in Chapter 4. The execution of Projects 2 and 3 is reported in Chapter 5. As the execution of Projects 2 and 3 are more critical to the findings of this research than for Project 1, the execution of Projects 2 and 3 is reported in much greater detail in this thesis.

Project Structure

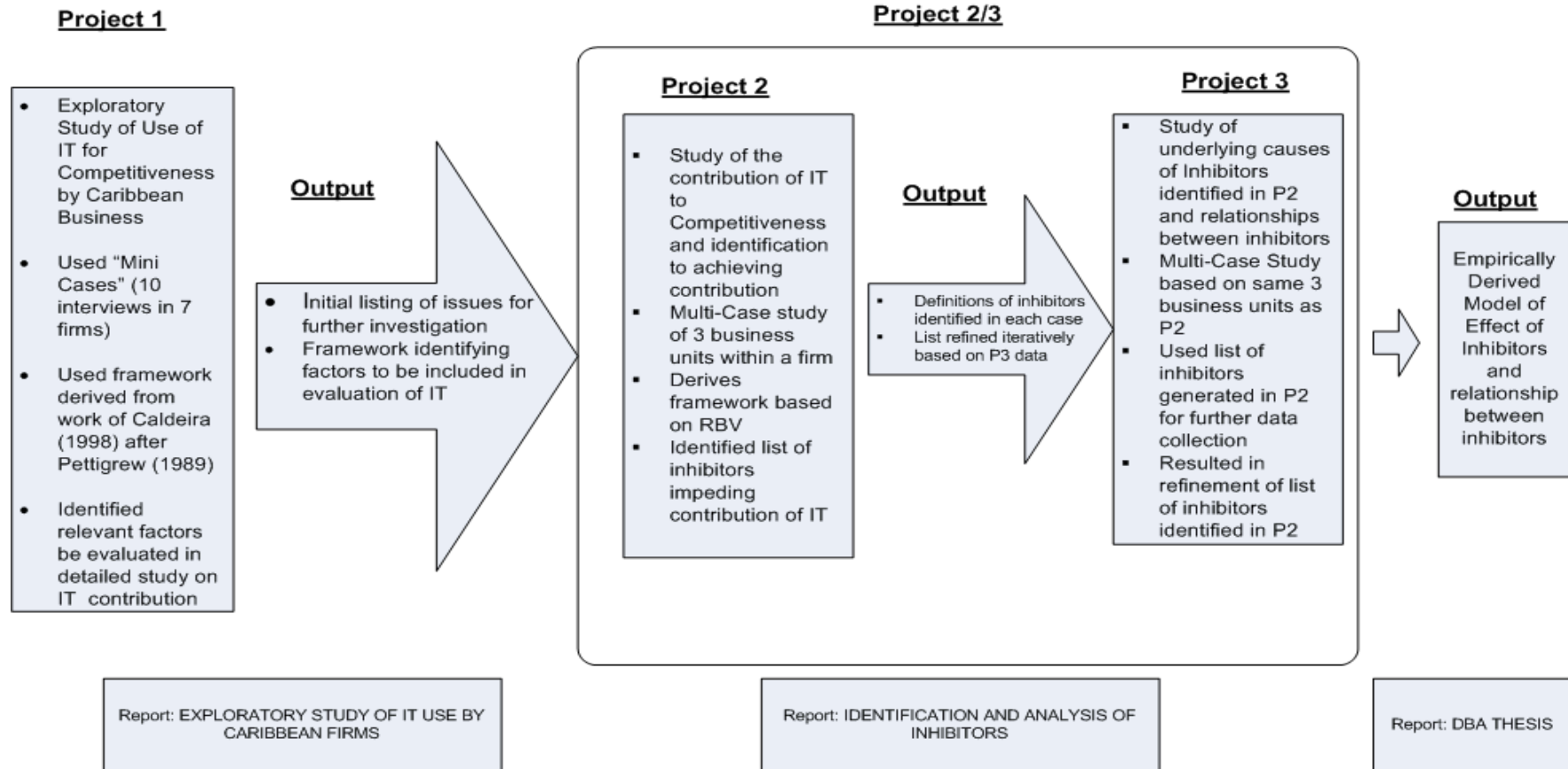


Figure 3-1: Research Project Structure (Source: Compiled by author)

3.3 Research Design Issues

3.3.1 Use of Case Study Methodology

The research uses a *Case Study* methodology. Yin (2003) describes a case study as

“An empirical enquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between the phenomenon and the context are not clearly evident” (p13.)

The ability of the case study methodology to allow a phenomenon to be investigated within the real life context in which it occurs is the characteristic that makes it well suited to this study. It was argued in Chapter 2 that the environment in which a Caribbean firm operates represents a nexus of geographic, economic and political circumstances that were particularly relevant to the objectives of the study. Further, as Pare (2004) points out, citing prior research, “the case study methodology is particularly well suited to IS research” because “any system cannot be separated from the context in which it is implemented and deployed” (p. 234).

The acceptance of the case study as a legitimate means of scientific research seems to have taken some time (Blaikie,2000; Yin, 2003). For example, Blaikie (2000) chronicles what he refers to as the “chequered career” (p. 214) of the case study in the social sciences. Much of the literature suggests that this form of research has gained increasing acceptance in the last few decades however. In particular, there has been increasing use of this method of study in the IS research field (Klein and Myers,1999; Markus and Lee, 1999; Pare, 2004), with several case studies appearing in both the academic and practitioner literature.

Examples of case studies on topics relevant to my research include: understanding successful adoption of IS/IT in SME in the Portuguese manufacturing industry (Caldeira and Ward, 2002); investigation of the information systems strategic planning process within a large Australian firm (Cerpa and Verner, 1998); impact of mergers and acquisitions on IT governance structures of a multinational firm operating in the Caribbean (Chin et al, 2004); illustrating organizational process for managing IT investments and measuring business value in a health-care organization (Kohli and Devarj, 2004); improving the IS organization/Business relationship within a firm (Peppard, 2001) and developing a model of how and why IT facilitates organizational learning (Scott, 2000).

Yin (2003) is one of the best-known proponents of the case study methodology, and offers detailed guidance on the design, execution, analysis and reporting of case studies. Yin’s work has been very influential and several other authors who offer guidance on use of case study research such as Harrison (2002) and Pare (2004) draw heavily on Yin’s work. Pare (2004), whose specific area of focus is the IS research field, also draws heavily on the work of Miles and Huberman (1994) and Eisendhart (1989).

Some of the most widely cited expositions of the methodology (e.g. Benbasat et al, 1987; Eidenhardt,1989; Yin, 2003) focus on conducting case studies in a positivistic paradigm. Pare's (2004) guidance for example, is explicitly directed at researchers conducting positivist research. There is however, a well-established tradition in non-positivistic case study research (e.g. Klein and Myers,1999).

While Klein and Myers (1999) argue that some of the criteria proposed for case study research in the positivist streams are "inappropriate" for interpretive research, several of the principles articulated in the positivist stream (Eisenhardt, 1989; Yin, 2003; Pare, 2004) provide useful guidance on the design of case studies even for interpretive research. Several of the principles discussed such as the method of selection of cases, development of data collection protocols, overlapping data collection and analysis, are applicable regardless of the research paradigm.

It should be noted that the objectives of design of Project 1 were such that it required less depth in the investigation. It therefore used a simpler approach based primarily on interviews with key managers in the target organizations. Interviews of this nature are referred to as "mini cases" by some authors and examples of this approach can be found in the IS research literature e.g. Brown and Bostrom (1989), Tudhope et al (2000) and Weil and Olsen (1989).

3.3.2 Issue of "engagement"

One of the issues that arises in the conduct of interpretive research, is that of "engagement"– the extent to which the researcher interacts with the subjects of the research (Nandhakumar and Jones, 1997). This has proven to be problematic for researchers, with the outcome of several research projects being criticized on the basis that the researcher's relationship with the subjects has influenced the outcome.

Nandhakumar and Jones (1997), attempt to address the issue of engagement directly, and while not offering a definition of the concept, they focus on "the relationship between the researcher and the phenomena he or she is studying" This, they argue, "is central to interpretive endeavour" (p. 110). The authors place a number of well-known research methods on a continuum from "distance" to "engagement". Those towards the "Distance" extreme are methods such as analysis of published data and textual analysis where the researcher has minimal if any direct interaction with the phenomenon while those at the "Engagement" extreme such as Consultancy and Action Research represent methods where the researcher is fully engaged with the phenomenon.

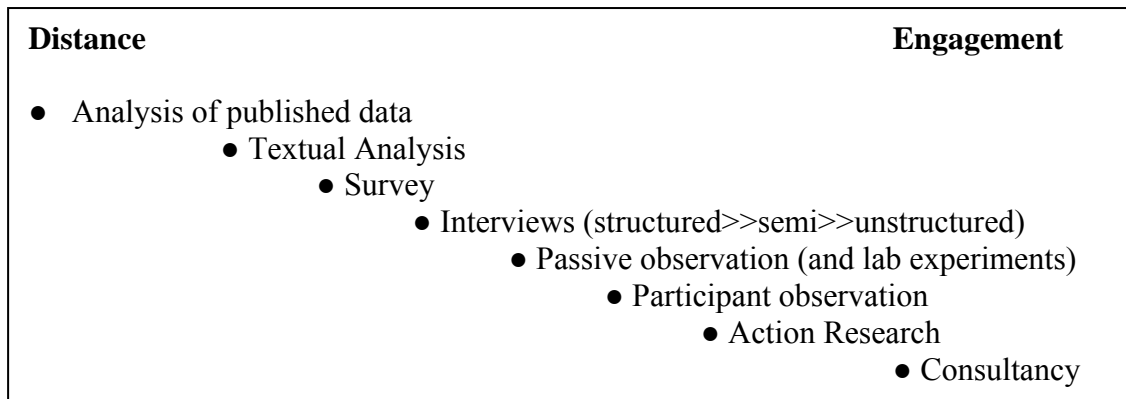


Fig 3-2: Distance and engagement between the researcher and subject with different data gathering methods (from Nandhakumar and Jones, 1997)

Several exponents of the case study method (e.g. Klein and Myers, 1999; Pare, 2004; Yin, 2003) point out that one of the strengths of the case study approach is the ability to combine data collection methods, even using both qualitative and quantitative methods in the same study. While Nandhakumar and Jones (1997) present the items on the engagement continuum as “research methods”, those in the continuum from “Analysis of published data” to “Participant observation”, can also be viewed as data collection methods. Since data collection methods are not mutually exclusive in case studies, the question to be answered is not “what specific level of engagement” is required but rather “how high a level of engagement” is required.

For Project 1, engagement at the level of interviews was adequate. For Projects 2 and 3 however, a higher level of engagement was required so the methods that involved higher levels of engagement were considered, as discussed below. The issue of engagement was particularly relevant because of the existence of a prior business relationship between the researcher and the target firm for Projects 2 and 3. At the time of the study, the author was also providing IT consultancy services to the firm and as such, exercised some influence in the company’s decisions on IT use. This is discussed further under “Position of the Researcher” in section 3.2.4.

Given the author’s business relationship with the target of the research, the positioning had to adequately account for this. The positions that initially appeared to be most appropriate for this research are the three most engaged ones - “Participant observation” and “Action Research” (AR) and “Consultancy”. The suitability of each is therefore reviewed further.

Although Nandhakumar and Jones (1997) point to Gummesson (1991) as proposing that *Consultancy* is a legitimate form of management research and cites the work of Newman and Kozar (1994) as an example, there does not appear to be a great deal of support for this view in the literature. Mumford (2001) for example, offers the following perspective on the difference between Consultancy and Academic Research:

“... the consultant is paid to further the interests of a particular group, usually the management. The academic researcher, in contrast is, ideally, dedicated to the pursuit of knowledge in an ethical manner. This means that he/she is there

to assist, not damage, the interests of the group or groups that he/she is studying.”(p. 15)

A decision was taken not to use Consultancy as the approach in this research as this could give rise to questions about both the purpose and the rigour of the research.

Review of the research methodology literature shows that despite criticisms, *Action Research* (AR) has become increasingly accepted as a valid research method. In particular, there is increasing evidence of its acceptance within the “mainstream” of IS research. For example, in recent years at least 2 IS journals – *Information Technology and People* (Kock and Lau, 2001) and *MIS Quarterly* (Baskerville and Myers, 2004) have published special issues on AR. Other discussions on use of AR in IS research include Davison et al (2004); Eden and Huxham (2002); Kok (2004); Mumford (2001); and Oleson and Myers (1999).

While the literature discusses different variations of the methodology, much of it places particular emphasis on rigour, in an effort to counter earlier criticisms. Baskerville and Wood-Harper (1996) for example, state that “Action Research is sometimes branded as consulting masquerading as research” (p 241). Several authors refer in some form or another to a 5-stage model, the stages of which Baskerville and Wood-Harper (1996) label as Diagnosing, Action Planning, Action Taking, Evaluating and Specifying Learning.

One of the requirements often stipulated for ensuring rigour in AR projects, is to have the target organization formally commit to actively participate in the project, based on agreed roles and responsibilities. This made AR an unsuitable choice for this research however. Although the target firm was willing to be part of the research and to grant the necessary access, it was not possible to get the formal commitment to active participation.

3.3.3 Use of the *Participant Observation* approach

Among the forms of engagement identified, the *Participant Observation* approach to data collection emerged as the most suitable for the research in Projects 2 and 3. This method is often associated with the *ethnographic* research methodology where the researcher immerses himself in the target research environment (Atkinson and Hammersley, 1998; Singh and Dickson, 2002). Singh and Dickson (2002) identify four approaches within the ethnographic tradition – “Postmodernist observation”, “Participant observation”, “Observation as participant” and “Realist observation”. These they argue, are “better seen as points on a continuum of subjectivity to relative objectivity rather than as discrete approaches” (p. 122).

The distinction offered by Singh and Dickson (2002), while not identical, is consistent with what Atkinson and Hammersley (1998) identify as a “widely used fourfold typology”. This consists of “complete observer”, “observer as participant”, “participant as observer” and “complete participant” (p. 111). The continuum referred to by Singh and Dickson (2002) is in principle similar to the continuum of “distance” to “engagement” proposed by Nandhakumar and Jones (1997).

While participant observation has historically been associated with the ethnographic tradition, it has also been associated with other interpretive approaches (Klein and Myers, 1999; Walsham, 1995) and particularly Action Research (e.g. Baskerville and Myers, 2004; Checkland and Holwell, 1999; Olsen and Myers, 1999). In fact, in discussing the essential premises of Action Research, Baskerville and Myers (2004) draw on the work of Mead (1913) to suggest that the action researcher *is a participant observer*. Nandhakumar and Jones (1997) attempt to distinguish participant observation from Action Research by stating that "Action Research ... differs from participant observation in that the researcher actively intervenes in the research context to try to achieve particular outcomes, rather than simply seeking to act as a 'normal' member of the context" (p. 115).

There is a precedent in the literature for the use of the participant observer approach to data collection in IS studies. Nandhakumar and Jones (1997) describes a participant-observer study on the development of executive information systems while Seltsikas (1999), discusses a participant-observer study in the use of information management to support the "process-oriented holistic" organizational form. Duhan et al (2001) also use the participant-observer approach in a study on the identification and development of an information systems strategy (ISS) in a knowledge-based SME.

3.3.4 Position of the Researcher

Another matter related to the issue of engagement, is the position of the researcher with regard to the research. James and Vinnecombe (2002) pose the question: "Does the personal involvement of the researcher in the subject of the research matter?" They argue that the individual does indeed matter and further state that:

"Acknowledgement of the individual's involvement in the research needs to be accounted for in the presentation of the research, in a way that does not pretend detachment" (p. 85).

In Project 1, I had no prior business relationship or direct involvement with any of the firms reported and had no specific knowledge of these firms' internal operations beyond information in the public domain. One of the measures I took to minimize potential bias from prior knowledge of the firms' operations was to conduct most of the interviews in firms located in Barbados, rather than in St Lucia where I was resident. Only 1 of the 7 firms in Project 1 is located in St Lucia. The other 6 are located in Barbados.

In Project 1, contact with the firms to arrange the interviews was facilitated through personal contacts (persons outside the firms who made contact with the target managers on my behalf, either directly or indirectly), rather than through formal communication directly the firms. This approach seemed to have made the interviewees more receptive to the interviews and more willing to be candid. In fact, in one instance, the interviewee stated that he had only agreed to allow the interview

to be recorded because my contact, a mutual acquaintance, had assured him that I was a trustworthy individual and would not misuse his statements.

The situation was different for Projects 2 and 3 because as pointed out in the discussion on “engagement”, at the time the research was being undertaken I was providing IT consulting services to the firm. This situation helped the research in a number of ways including:

- It made it easier to gain access to the management of the firm, at both the business unit and corporate level.
- It allowed me to become highly engaged with the firm and the respondents - for example, by attending meetings.
- It allowed greater access to information that could be used for triangulation. For example, it is highly unlikely that I would have been allowed to review files and correspondence on IT matters had I not had this type of relationship with the firm.
- It allowed for more candid discussions to take place with the managers.

However, the prior relationship with the firm also introduced the risk of bias. I adopted the following strategies to minimize the risk and potential effects of bias on the research:

- Strauss and Corbin (1998) emphasize the importance of a willingness to “give voice” to the respondents as one of the requirements for maintaining an objective stance. As far as practical, I relied on explicit statements by the respondents (or contained in the documents reviewed) to draw my conclusions. This allowed me to minimize the number of instances where I used my prior knowledge or judgment to determine what the respondent implied, therefore reducing the likelihood of introducing my bias into the interpretations.
- When I attended meetings, although making my own notes, I used the notes prepared by the company (when available) as the data for the research, instead of my own notes. These notes represented what the management agreed were the key points or decisions of the meeting. Again, this minimized the risk that my interpretation of the events would dominate. Note however, that as a meeting participant, I was entitled to raise “errors and omissions” if I believed that the meeting notes did not accurately represent what transpired. I exercised this privilege on at least 2 occasions.
- In presenting the case report I have made extensive use of quotations from the respondents and from other data used during analysis in order to provide greater transparency as to how the results were arrived at.

3.3.5 Case Selection Criteria

Eisenhardt (1989) emphasizes the importance of careful selection of cases, pointing out that a good practice in case study research is to use theoretical sampling, where cases are selected for theoretical, rather than statistical reasons. Eisenhardt also states

that “selection of an appropriate population controls extraneous variation and helps to define the limits for generalizing the findings.” (p 537)

These considerations have been factored into the selection of cases for the study. Based on the purpose and objectives of the study, it was determined that the firm or firms selected for the study should meet the following criteria.

1. Geographic scope

The geographic area of focus for this research, as discussed in Chapter 1, is the Caribbean, as shown at Appendix A. However, the Caribbean covers a significant geographic area, and it was not practical to cover firms throughout the region. Due to the practical constraints of travel and access, I decided to restrict the research to firms in St Lucia and Barbados which is in close proximity to St Lucia and has convenient air links (30 – 45 minutes flying time). For Project 1, which required relatively short periods of engagement with respondents, I conducted most of the interviews with firms in Barbados, as explained earlier. For Projects 2 and 3, which required an extended period of engagement, I conducted the research in St Lucia.

2. Economic sectors

A decision was taken to restrict the research to firms involved in “service” sectors and in particular, in the “Wholesale and Retail Trade” and “Financial Intermediation” sectors. Appendix B shows the Gross Domestic Product (GDP) by sector for St Lucia during the period 2001-2006 (Government of Saint Lucia, 2006). Note that the sectoral classification shown in Appendix B is the one typically used by Caribbean governments for reporting economic data.

As Appendix B shows, the “Wholesale and Retail Trade” and Financial Intermediation sectors are economically very important, each consistently accounting for over 10% of St Lucia’s Gross Domestic Product (GDP) during the period 2000-2006. The nature of these types of business also make them open to competition from outside the Caribbean, making it imperative that they respond to the competitive challenges identified in Chapter 2.

Of the 7 firms in the study reported in Project 1, three were in the “Wholesale and Retail Trade” sector, two in the “Financial Intermediation” sector and two in the “Other Services” sector. Of the 3 business units that were the subject of the case studies in Projects 2 and 3, two were in the “Wholesale and Retail Trade” sector and one was in the “Financial Intermediation” sector (Insurance).

3. Firm characteristics

From the outcomes of Project 1, it was determined that any firm to be used for detailed investigation in Projects 2 and 3 should meet the following additional criteria:

- **Performance.** The study is focused on the contribution of IT to competitiveness. It is reasonable to expect that, all else being equal, a firm in a strong competitive position will provide a better opportunity for exploring how IT contributes to competitiveness than one that is in a weak competitive position.
- **Financial strength.** The firm should be in a position to make the investments in IT that it determines will allow it to meet its objectives. This will allow the study to focus on the effects of the way the firm manages and uses IT, as opposed to the effects of having or not having the IT that it deems worthwhile. This will eliminate situations such as that occurring with Firm F in Project 1, where the Director indicated that the firm would like to make greater use of IT but could not afford it.
- **Significant role for IT.** There should be evidence that the firm makes significant use of IT to support its activities, such that failure of its IT systems to function as required is likely to have a negative impact on its operations and competitive position. In such a situation it is more likely that IT will occupy the attention of management, and that investments deemed necessary to derive the desired benefits from IT will be made.
- **Longevity and credibility.** The longer the firm has been in operation, the greater the opportunity for determining the effectiveness of strategies that it has implemented, and the sustainability of any competitive advantages it may have gained. Additionally, the longer the firm has been in operation, the more likely it is that the views of its managers will be credible, as there is more history on which to base those views. The latter is particularly important in this study given the need to rely on the views of managers because of the absence of factual data on firm performance, as explained in Section 3.2.1.
- **Opportunity to compare experiences and results.** The case studies selected should offer variation in the results and experiences, so that comparisons between causes and effect are possible.
- **Access and Commitment.** Since the study required in-depth investigation that involved interviews and possibly eliciting confidential or sensitive information, it was important that the target firm was willing to participate in the research and to provide the information required.

The application of the above criteria to the selection of the cases for Projects 2 and 3 is discussed in Chapter 5.

3.4 Data Collection

3.4.1 Data Sources

For all 3 projects, the primary source of data was formal interviews with managers within the targeted firms. In Project 1 the firms did not make any additional data (such as IT plans, budgets or evaluation results) available and there was no significant data on the topics of interest available from third-party sources. Even in the case of publicly traded companies that were required to produce Annual Reports to shareholders, these reports did not discuss the firms' IT initiatives or their use of IT.

For Projects 2 and 3, a variety of internal data sources were used. The primary sources of data were interviews. A total of 23 formal interviews were conducted with a total of 16 managers and supervisory level staff, as detailed in Section 5.5.5 of Chapter 5. The interviews were based on the data collection protocol described in Section 3.4.2.1 below, and were recorded using audiotape. In all cases where interviews were recorded, permission to record the interview was first sought and obtained from the interviewee. The following additional sources of data were used to triangulate interview data:

- Documentary evidence was collected where available. This included minutes of meetings held to discuss IT matters (prepared by the respective business units or the IT Department), technical documents, internal reports and correspondence to or from the business units that dealt with IT matters. Because of the firm's practice of not publicly disclosing financial data however, documentation on financial matters such as budgets and financial statements, was not available.
- Participant observation methods were used to gather additional data and obtain insights where appropriate. The data gathered through these observations was mainly used to supplement the data gathered through interviews and documents, or to provide insight into other issues that needed to be explored. For example, informal discussions with a manager about a technical problem experienced lead to the discovery of the minutes of a meeting that documented the problem. Another example is where managers complained about the negative effects of a slow checkout process that could be directly observed.

The method of collection and recording of this data is described in the following section.

3.4.2 Data Collection

3.4.2.1 Data Collection Protocols

The collection of interview and other data was guided by the Data Collection Protocols developed for the project. Project 1 involved 10 semi-structured interviews with business and IT managers in 7 firms. Given the exploratory nature of this study, the interview protocol contained a small number of broad questions which ensured

that specific topics were addressed in the interviews, but which were broad enough to allow questioning to pursue issues arising during the interviews. The questions were grouped under 3 themes and addressed the questions identified in Section 4.2. The themes were:

- Competitive Environment
- Competitive Strategy and the role of IT
- IT Capability and Experience

The data collection protocol for Projects 1 is shown at Appendix C.

The data collection protocol for Project 2 was derived from the analytical framework used in Project 1 and the findings of Project 1. An initial protocol was created from the topics in the analytical framework and revised by:

- Identifying and summarizing the key issues that were expected to be addressed within each of the elements of the analytical framework.
- Piloting the instrument prior to the main study
- Refining and retesting the instrument

The instrument was pre-tested through interviews with managers in the target firm, but in business units other than those used in the case studies. A local commercial consultancy assignment also provided the opportunity to review the elements of the framework and make a further assessment of the suitability of both the content and structure, as a basis for conducting interviews.

From the above, it became clear that modifications were necessary to address the following:

- The order in which the issues are presented in the analytical framework did not provide for a logical flow of the discussion during interviews
- The structure led to overly repetitious questioning, as questions and issues that had different meanings at the analytical level appeared to be similar to the interviewee.

In order to address these, the instrument was redesigned to group together questions that sought to elicit similar types of information. Additionally, the protocol was divided into thematic sections that would be more meaningful to the interviewee. The result of this is a data collection instrument containing 7 thematic areas, but still grounded in the previously derived framework. The 7 thematic areas are:

- Competitive Environment
- Competitive position and response
- Internal Factors
- IT-specific factors
- IT role and expectations

- IT experiences
- IT and environment

The revised protocol was further tested with through interviews and discussions with managers in the target company who were not participants in the study (a similar, but not identical group to those involved in the first test). There was also a further opportunity to test in another consultancy assignment, this time with a firm in the wholesale/retail sector, specializing in seafood products.

These additional tests resulted in two types of minor revision (a) the wording of some questions to make them more explicit and (b) some changes in the order in which questions were presented within a section to allow a better flow of the discussion. However, there was no change to the thematic areas identified. The revised version of the protocol used during the interviews is shown at Appendix D. Note that the protocol does not represent a questionnaire, but rather a guide to the information to be elicited from respondents. In many cases during the interviews, it was not necessary to raise some items as separate topics as respondents addressed them on their own initiative during the discussions.

For Project 3, the list of inhibitors identified from Project 2 was used as the basis for subsequent interviews and data collection. This is shown at Appendix E.

3.4.2.2 Participant Observation

There were 3 main methods by which I collected participant observation data:

- Attending meetings.* Each of these meetings involved one of the business units being studied. Most of them also involved the IT Department and in some cases, vendors. During these meetings I made notes of the main points raised. As I explained in section 3.3.4, in instances where a formal record or minutes of the meeting were prepared by the business unit or IT Department, I used this as the primary record of the meeting.
- Holding informal discussions with managers and staff members.* These were not taped as there was no prior agreement to do so. In some cases I was able to make notes during the discussions, but in several cases the discussions were impromptu and there was no opportunity to make notes. In such cases, I subsequently wrote a note of points that emerged during the discussion that appeared to be relevant.
- Direct observation.* This was used particularly for observing technical features of the IT systems. It was also used to observe location and access to IT facilities by managers and staff and how IT was being used for customer service functions such as customer checkout.

3.5 Data Analysis

3.5.1 Overview of the process and Analytical Frameworks

Figure 3-3 illustrates the overall data analysis process used in this research. The Nvivo software package (Richards, 1999), was used to create a “case database” (as recommended by Yin, 2003) and as a tool for analysis of the data. There were two main types of input into Nvivo: (a) the analytical framework, which was operationalized as a “node” structure within Nvivo and (b) the data sources such as transcripts, meeting notes and e-mail messages that were loaded as “documents” in Nvivo.

Two analytical frameworks were developed to support the collection and analysis during the research. One framework was developed for the initial exploratory study (Project 1) and a second one for the identification and analysis of inhibitors (Projects 2 and 3). These frameworks were derived from the literature to provide a theoretical and conceptual basis for the empirical work.

For Project 1, the work of Caldeira (1998) and Caldeira and Ward (2002) provided the initial basis for the framework. Caldeira (1998) and Caldeira and Ward (2002) report on an empirical study of factors affecting the varying levels of success in the adoption and use of IS/IT in Portuguese manufacturing Small and Medium-sized Enterprises (SMEs). The study develops and uses an analytical framework based on the work of Pettigrew et al (1989) and Pettigrew and Whipp (1991) in the field of strategic change. The framework analyses the data along four main dimensions: Content, Internal Context, External Context and Process.

I further enhanced Caldeira’s framework using other constructs from the literature, and also to take account of the nature of the data gathered. A listing of the constructs in the analytical framework for Project 1 is shown in Table 3-1 below. The derivation of the framework is discussed further in Chapter 4.

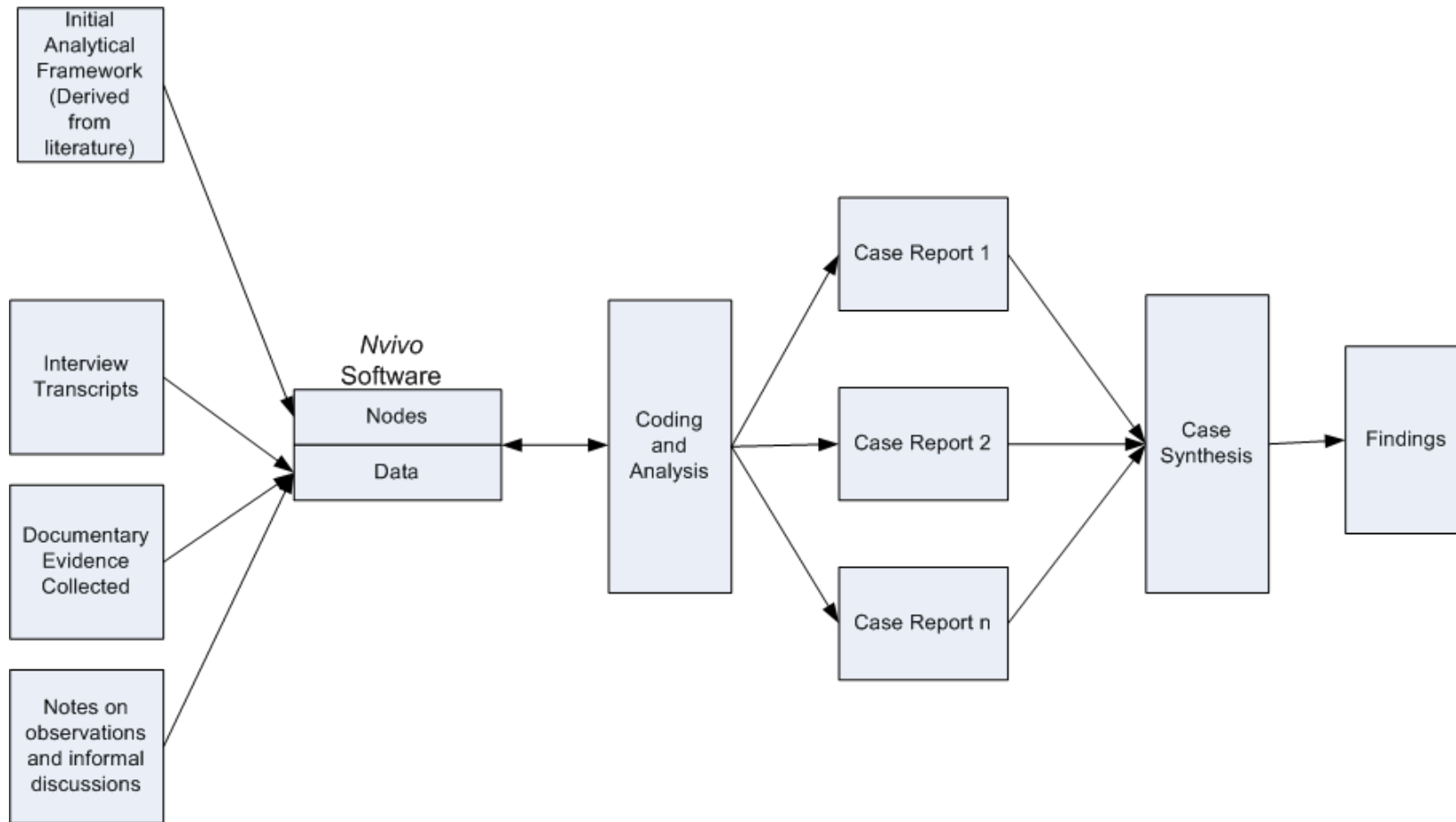


Figure 3-3 Data Analysis Process (Source: Compiled by author)

Table 3-1: Summary of Analytical Framework for Exploratory Study (Project 1)

Framework category	Items
1. Internal Context	<ul style="list-style-type: none"> • Resources • Management attitudes • Staff attitudes (non-management) • IT competencies • Organizational structure • Sources of competitive advantage • Expectations from IT • Effect of age of staff • Sources of IT impetus • Other internal constraints
2. External Context	<ul style="list-style-type: none"> • Level of threat • Sources of Competition • Changes in competition • Regional and International context influences • Technology effects • Consumer behaviour • Availability of external support • Comparison of IT to competitors • Competitors' advantage • Government policy and action • Public perceptions and expectations • Other external constraints
3. Process	<ul style="list-style-type: none"> • How IT developed over time • How IT managed • How IT deployed • IT Role • Competitive responses • Business and IT strategy • Improving benefits from IT • Staff training
4. Content	<ul style="list-style-type: none"> • IT applications available • Extent of IT use • Benefits realized from IT • Experience with IT to date • Potential and unrealized benefits • IT successes • IT difficulties

Source : Compiled by author

The Resource-based View (RBV) was used as the theoretical basis for deriving the analytical framework used in Projects 2 and 3. A model proposed by Melville et al (2004) provided the initial basis from which the framework was derived. The

concepts used in the framework are summarized in Table 3-2 below. The framework is illustrated in Figure 3-4. The derivation of the framework is discussed in Chapter 5.

Table 3-2: Summary of Concepts for Model

Concept	Description
Resources	Assets and capabilities that are available and useful in detecting and responding to market opportunities or threats. Assets represent anything tangible and intangible the firm can use in its processes for creating, producing, and/or offering its products (goods or services) to a market. Capabilities represent “repeatable patterns of actions in the use of assets to create, produce, and/or offer products to a market. (After Wade and Hurland, 2004). Resources are subdivided into Technical IT Resources, Human IT Resources and Complementary Organizational Resources.
Technical IT Resource (TIR)	All physical IT resources, including hardware, software and infrastructure. Also includes the data maintained by the IT systems as well as reports, analyses, documents or other outputs produced by the IT systems.
Human IT Resource (HIR)	IT skills, including the technical skills of IT staff, as well as the IT skills of non-technical staff that are relevant to the effective use of available IT systems.
Complementary Organizational Resources	Other firm assets and capabilities including business processes that provide synergies with IT resources.
Inhibitors	Factors that reduce the firm’s ability to derive the potential benefits from the available IT resources
Contributions	Benefits attributable to the firm’s use of IT, that contribute to the firm achieving a competitive position
Core IT application	IT application used to support the main service delivery or revenue generation functions of the business.

Source: Compiled by author

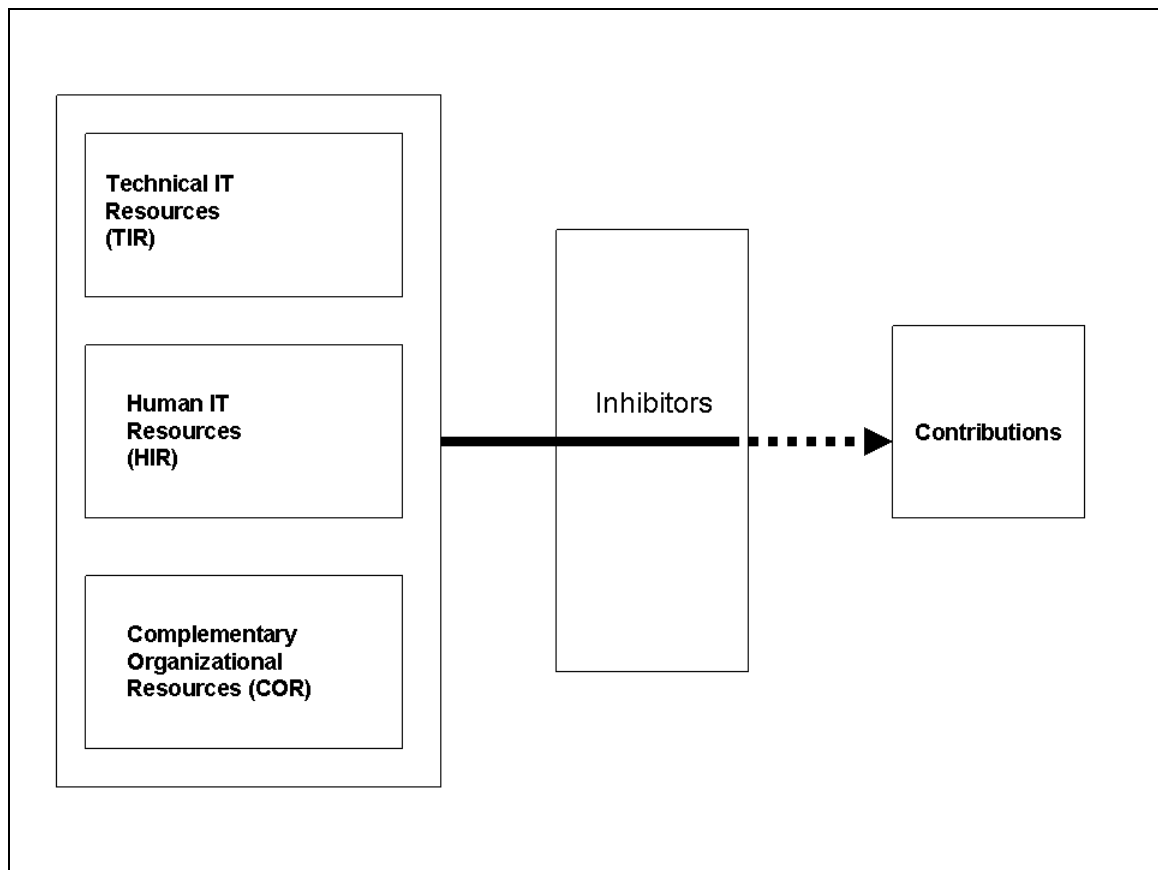


Fig 3-4: Analytical Framework for P2/P3 (Source: Compiled by author –see Section 5.4.3)

In Figure 4, the combination of TIR, HIR, COR leads to “Contributions” to a firm’s competitiveness. However, the full potential contribution is not realized due to the presence of inhibitors

3.5.2 “Operationalizing” the Data Analysis process

The analytical frameworks were represented within Nvivo as *nodes*. The data was represented as *sources*. Where the data was available in electronic format (e.g. interview transcripts, reports, e-mail messages), the actual files were loaded into Nvivo. Where the data was only available in hard copy, the Nvivo feature for representing external data sources was used.

While the analytical models described in Section 3.5.1 provided the broad framework for analysis, an inductive approach, informed by *Grounded Theory* (Glaser and Strauss, 1967), was used for the detailed coding and analysis. The process was influenced by the practical guidance provided by Strauss and Corbin (1998), particularly with regard to the use of “microanalysis”, which Strauss and Corbin (1998) define as:

“The detailed line-by-line analysis necessary at the beginning of a study to generate the initial categories (with their properties and dimensions) and to

suggest relationships among categories; a combination of open and axial coding (p. 57)”.

In addition to its ability to support the coding of data, two features of Nvivo proved particularly useful for data analysis during this study – the “relationships” feature and the “models” feature. The relationships feature allows relationships between nodes to be defined and for the data on which this relationship is based to be coded with the relationship. The “models” feature allows, among other things, for the relationships between nodes to be represented graphically. These two features were used to generate *causal networks* (Miles and Huberman, 1994) from the data, as discussed in Chapter 5.

The results of the coding and analysis were then used to write the case summaries presented. Following completion of the case summaries, the results were compared, to search for patterns or contradictions. This was combined with the literature to derive the case findings.

An illustration of the data analysis process is illustrated below. It uses an example from the Project 2 and 3 data.

3.5.3 Data Analysis Illustration

The following example from the study of Identification and Analysis of Inhibitors reported in Chapter 5 illustrates the steps used coding the data. This example is based on analysis of data in Case 3 – ABC General Insurance.

3.5.3.1 Using “Microanalysis” to identify Inhibitors

1. Interview with GM of ABCGI

The following text was encountered during the “microanalysis” phase of the transcript of the interview with the General Manager (GM) of ABC General Insurance (ABCGI). The GM was asked for his views on the attitude of the senior management at the Board of Directors level towards IT use with ABCGI.

Question: Is there anything about their attitude towards IT that either helps or hinders? What would you consider to be their attitude towards IT at the head office?

GM’s response: Maybe sometimes the expectations are too great, maybe sometimes they have had bad experiences in trying to implement software in other areas of the company’s business, and so they are a little bit skeptical, they look at the whole thing with a jaundice eye and say boy, I’ve been through all this headache before and it hasn’t worked and I think that’s partly again maybe they felt like some of the software wasn’t worked out sufficiently in advance, they didn’t go into too much detail. I am one who always says you cannot cover every single thing, it’s only when you start using the system you say it doesn’t do this and it doesn’t do that. It is difficult for instance, for management in their day to day work to step aside and do a full implementation plan for a computer system which covers all the steps of the business and all the different types of scenarios that would come up.

This was the first interview analyzed for this case and this was the first response addressing the attitudes of the senior management. Therefore, new Nvivo nodes were required for coding the response. Following Strauss and Corbin’s (1998) recommendation to consider alternate paths, two “child nodes” were created under the “Inhibitors” node for the ABCGI case to code this section of text. The initial naming of the nodes was guided by the language of the respondent:

- (a) Senior management expectations too great
- (b) Senior management skeptical about value of application

Figure 3-5 shows an example of the Nvivo applicable coding screen

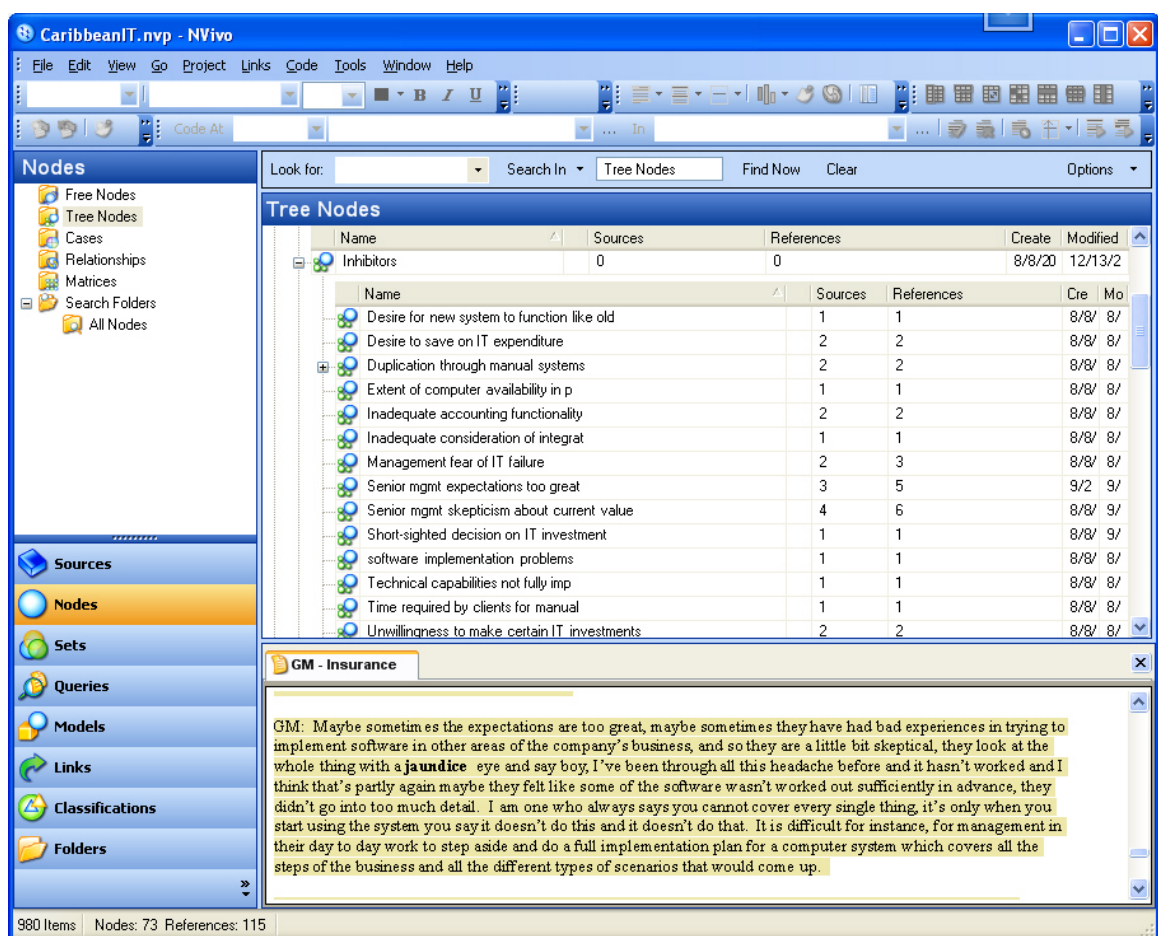


Figure3-5: Example of a coding screen in Nvivo (Source: Extracted from Nvivo)

2. Interview AM of ABCGI

The following text is from the transcript of an interview with the Assistant Manager (AM) of ABCGI, where he responds to a similar question:

Question: If we go to the head office level, the senior management of the company, what is your impression of their attitude towards IT²?

AM's response: I think they think IT is important, what I think happens with them is that they want it to happen too quickly. The little I know of IT and getting new products, you always have teething problems, but I get the impression that they just want everything to work just like that. It's not that they are against IT, they fully embrace it and they want to work with it, they just expect it to work right away with no problems, without looking at the uniqueness of the situation.

Following Strauss and Corbin's principle of "constant comparison", this statement was compared to the coding for similar statements from the GM and coded as "Senior expectations too great" as the text and meaning of the statement conveyed that sentiment.

3. Interviews with GFD and CEO

During the coding of the interviews with the Chief Executive Officer (CEO) and Group Financial Director (GFD) of the ABC Group, additional data was encountered that referred to the above. The CEO and GFD are both members of the ABC Group Board of Directors and are part of what are referred to as "senior management" or "corporate management".

The following is the GFD's response to a question regarding his views on IT investments that he did not consider successful. In his response he specifically mentioned ABCGI (which he referred to as "Insurance"). This was shortly after implementation of the INSURSYS system (discussed in Chapter 5).

Question: Are there any implementations or investments you consider to be a failure, even if not an outright failure but let's say the results have been well below expectations?

GFD's response: I would say Insurance and maybe it is a bit premature but we have been into the system for five months now and we have not been able to determine whether we are profitable or not. Now we can guess or we can do an estimate to determine whether or not we are profitable but it is not the sort of implementation that has engendered a lot of confidence from the directors.

Again comparing this to the two codes identified earlier, the above text seems consistent with the "Senior management skeptical about the value of the application" and was coded as such.

² The format of the questions were not always identical because the conversations flowed differently from interview to interview.

The following shows the response of the CEO to the question about the attitudes of senior management towards IT within the firm:

Question: At the senior level of management, how would categorize their attitudes towards the use of IT within the firm?

CEO's response: I would say that there is a general acceptance that we have to invest IT, there is some resistance to investing huge amounts of money into software - for instance the investment we had to make into the Insurance software was substantial and the perception is – is that investment justified? Do we really have to put that money into it? What are the benefits that we are going to derive from it? Is it going to generate us any more business? Is it going to realize us any more profits? It is difficult to quantify what dollar value you can place on the benefit derived from the software like that. So I think that there is some reluctance to spend money on software if there is not a very clear perception of the benefits derived from it.

The CEO's response above was consistent with the "Senior management skeptical about the value of the application" code, originally derived from the view of the Insurance GM.

4. Choosing the nodes

Of the two nodes initially coded for the same text, there was much more support for (b) - "Senior management skeptical about the value of the application" than for (a) – "Senior management expectations too great". Also, a determination of the expectations of management being "too great" required a highly subjective judgment. Thus the inhibitor was coded as (b) – "Senior management skeptical about the value of the application". This inhibitor is discussed in Section 5.8.4 under the ABC General Insurance case.

Note however that although the "Senior Management expectations too great" was eventually not included in the summary of inhibitors for the reasons identified above, I raised it with the CEO during the second interview. His response:

Question: With the benefit of hindsight, do you think the expectations of what the system would deliver were reasonable or do you think you have too high expectations?

CEO's response: For the price that we paid, for how it was represented, I think our expectations were reasonable. I don't think we came with any set of parameters that was outside the norm in the insurance industry. It's not that we are asking for a system that had to do very complex calculations for us. These were, in our mind, very basic requirements of a software system in an insurance company.

This reinforced the conclusion that "Senior management expectations too great" was not supported in the data. However, it supported an explanation why the senior management were skeptical - that – "Senior management expectations of implementation not met".

Note that not all quotes supporting each conclusion are included in the case summaries in Chapters 4 and 5. I made a decision to use a selection of quotes to demonstrate the support for my conclusions. Attempting to include all relevant quotes would have made the case reports repetitive and unwieldy, and ultimately less readable.

3.5.3.2 Deriving Relationships and Causal Network

This section illustrates how the relationships and subsequently the causal networks were derived from the data. It uses the example of the nodes described in the previous section.

Using Nvivo's Relationships feature, a "relationship type" called "*Contributes to*" was defined. "A" contributes to "B" if the data shows that the occurrence of "A" fully or partially accounts for the occurrence of "B".

1. Deriving the relationships and coding in Nvivo

In reviewing the data to clarify why senior management were "skeptical", a cause identified as "Senior management expectations of implementation not met" also emerged. This was supported by the statement made by the CEO which was shown in paragraph 4 above, as well as statements from the GFD and GM. An Inhibitor node representing "Senior management expectations of implementation not met" was also created.

A "contributes to" relationship was then created using the Nvivo "Relationships" feature to represent "Senior management expectations of implementation not met" contributes to "Senior management skeptical about the value of the application". Data also emerged to show a relationship between a node labeled as "Difficulty in obtaining reports required" contributes to "Senior management expectations of implementation not met".

Through this process a number of relationships, each representing a pair of nodes, was derived. (There were 34 relationships for the ABCGI case). Figure 3.6 shows an example of the "Relationships" screen in Nvivo.

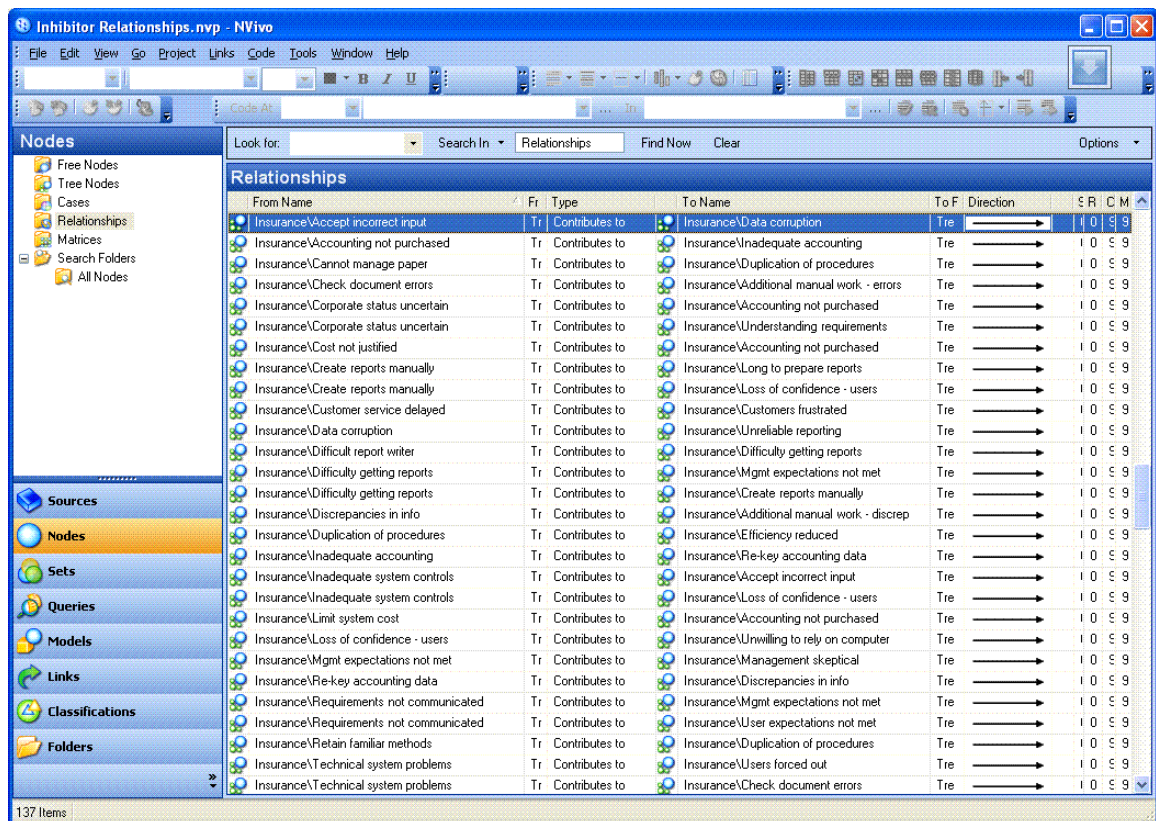


Figure 3.6 Defining Relationships in Nvivo (Source: Extracted from Nvivo)

2. Creating the Causal Network

The causal network for each case was created using the “Model” feature in Nvivo by “dragging” all the relationships for that case into the model drawing area. Nvivo automatically places circles to represent the nodes and a connector symbol to represent the relationship. This is illustrated in Figure 3. 7 below.

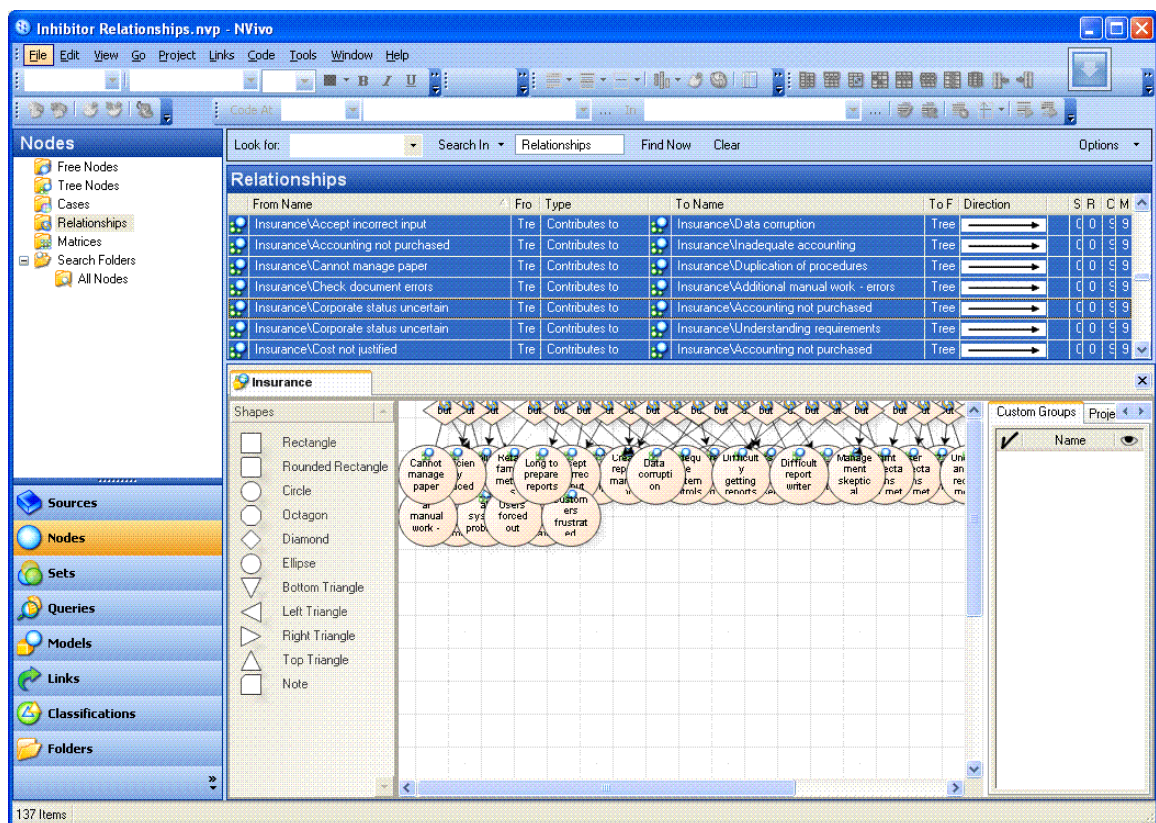


Figure 3.7 Nvivo “Model” (Source: Extracted from Nvivo)

The nodes and connectors can then be moved around and otherwise “tweaked” to improve the visual appearance, without changing the underlying relationship. Note also that the models are initially created as “dynamic” models – if the underlying nodes and relationships are changed, the model changes to reflect that.

The above process has led to the Causal networks shown in the cases in Chapter 5

3.5.3.3 Exclusion of data during analysis

In addition to criteria for inclusion of data in the analysis, it is also important to understand what data was excluded and why, in order to ensure reliability and replicability. Data was excluded from the analysis when it was not supported by any other available data or was contradicted by other available data. The following scenarios illustrate how I made the decisions on what to exclude:

1. Assertions not supported by other available data

Assertions that were not supported by any other available data were excluded.

Example: In discussing reasons why the store staff were not using the computers to check the availability of items when customers made enquiry, the Operations Manager (OM) of Drugstore (Case 1 in Chapter 5) stated:

“They just find it easier to pack what they have and if a customer comes to look for something else, just say ‘sorry, we don’t have it’ - that’s just an easier route out.”

No other data was available to support the view that the staff found this particular behaviour “easier”. Further, an investigation of this would require a suitable method for ascertaining the views of the staff on which responses to customer queries they found “easier”. Such an investigation would have been outside the scope of the design of this study.

An important additional consideration in such cases was to what extent the data, if supported, was likely to change the findings – in particular, whether it contradicted other data or findings. In this example, while the OM’s assertion, if accepted would add to the list of reasons why the floor staff were not using IT on some occasions, it would not change the basic conclusion that they were not making as much use of IT as the management would like.

2. Assertions contradicted by other data

The General Manager (GM) of (Case 2 in Chapter 5) identified the lack of an interface between INVENSYS-SQL and the accounting system as an inhibitor. During an interview, he stated:

“I think it makes procedures a lot more complicated ... I think it creates a lot more work for accounting staff ... it makes the accountant’s job a lot harder, no question about that ... and I think because of the 2 systems we have to employ a couple more people. So we would be able to save time and save wages I guess, we would be able to make the Department leaner and meaner.”

However, the notes of a subsequent meeting between the GM and the IT Department, at which the GM was present, showed that a decision was taken that it was not necessary to implement an interface:

“It was decided that a direct interface was not necessary at this point since the plan is to only carry forward totals to the [the accounting system]. [The Accountant] will provide an outline for the report and IT Department will develop the report. (Source: Meeting notes - 2 Feb, 2006)”

The notes of the same meeting also offer some explanation as to why the direct interface was considered unnecessary:

“Currently A/R [Accounts Receivable] clerks enter detailed customer transactions (invoices and payment on account) in [the Accounting System]. This is unnecessary since details are already being kept in INVENSYS-SQL. The process will change so that only totals are entered into [the Accounting System] (Source: Meeting notes - 2 Feb, 2006)”

Further, none of the other respondents pointed to the absence of the interface as an inhibitor. Therefore, the absence of an accounting interface was excluded from the list of inhibitors derived for Home Store.

3. Resolving Contradictory statements or evidence

There were instances where contradictory evidence did not “cancel out” each other as in the example above, making it necessary for me to make a judgment as to which side of the argument to give more weight to. In such cases I obtained additional data that I could use to make a judgment.

One example that illustrates this is the view as to whether the number of “access points” (computer workstations) available to staff in the Drugstore’s stores was inadequate. Both the Drugstore business unit managers (the Director and Operations Manager) considered the number of access points to be inadequate, and identified this as contributing to the store staff using the IT system less than management would have liked. The CEO on the other hand, did not believe that the number was inadequate. (This example pertains to Case 2 – Section 5.6.4, paragraph 6)

Given the importance of the CEO as a decision-maker within the firm, his views could not be automatically discounted. In order to decide whether to include “Inadequate number of access points” as an inhibitor, I did the following:

- I obtained data from the IT Department and the HR Department on the number of access points and the number of Drugstore staff who actually worked in the stores respectively
- I visited 3 stores and observed the location and availability of the workstations

The data showed that the ratio of the number of staff to the number of available access points was high at the stores. Further, from my observations I noted that those available were not located near to the shelves where the merchandise was displayed. Given that this evidence supported the view of both of the managers who were directly accountable for the running of Drugstore, I concluded that “Inadequate number of access points” should be included as an inhibitor.

4. Inhibitors removed or revised during the review process

The execution of the identification and analysis of inhibitors as 2 projects with separate data collection phases also provided an opportunity for validation of the data collected in the earlier phase. Interviewees were presented with the list of inhibitors identified for their respective business units and were first asked whether they agreed these were inhibitors. If they did, they were then asked their views on the causes and effects. In most cases, the interviewees agreed, but in some cases they did not. One interesting instance was in the ABCGI Case (Case 3).

In the earlier round of data collection and analysis, the increased length of time taken to serve customers because of increased data entry requirements of the new INSURSYS system was identified as an inhibitor. In the earlier interview, the Assistant Manager (AM) stated:

“You have to understand the uniqueness of our situation in that we are starting a new company and clients have to fill out a lot more forms now, so I don’t think the clients are really seeing the benefits in that they spend a lot more time in here”

However, in the second round of data collection, it was no longer considered an inhibitor. The AM stated:

“We serve customers a lot quicker now. I think that’s the one good thing on the system, I think we serve customers a lot quicker. I know brokers say that all the time, they can come in and out there very quickly. Especially with the triggers and everything.”

The AM explained that the need to collect data had been reduced since it was not necessary to collect the information again when the customers’ returned for renewal of their policies a year later. In an interview with the Underwriting Supervisor, she also explained that the fact that an increased amount of information was requested from customers had proven to be a benefit in that it made it easier to produce customer documents directly from the system.

Thus although “delays caused by the need to obtain additional information from customers” had been identified as an inhibitor initially, it was subsequently dropped.

3.6 Ensuring Case Study Quality

The importance of developing a good case study design to ensure quality – both in terms of the rigour of the process and the quality of the results, is a point emphasized in the case study guidance literature (Eisendhart, 1989; Harrison, 2002; Yin, 2003). Yin provides specific guidance on how quality can be ensured by identifying four criteria that case study designs should meet and tactics for ensuring these criteria are met. The four criteria identified by Yin are Construct Validity, Internal Validity, External Validity and Reliability.

The methods applied in the design and execution of the case studies have been discussed in the previous sections. Table 3-3 below summarizes how the design has met Yin’s criteria for quality.

Table 3-3: Summary of Case Quality Criteria for Projects 2 and 3

Test	Description	Case Study Tactic	Measure Taken
Construct Validity	Establishing correct operational measures for concepts being studied	<ul style="list-style-type: none"> • Use multiple sources of evidence • Establish chain of evidence • Have informants review draft case study reports 	<ul style="list-style-type: none"> • Multiple interviews within each business unit • Interviews at both the business unit level and the corporate level • Two rounds of interviews • Systematic process from data collection to analysis • Reviewed list of inhibitors with interviewees during second round of interviews
Internal Validity	(For explanatory or causal studies only, and not for descriptive or exploratory studies) Establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships	<ul style="list-style-type: none"> • Do pattern matching • Do explanation building • Address rival explanations • Use logic models 	<ul style="list-style-type: none"> • Use of multiple data sources to derive causality • Explicit recognition of multiple contributors to causality • Evaluation of contradictory evidence and explanations before accepting or rejecting explanations
External Validity	Establishing the domain to which the study's findings can be generalized	<ul style="list-style-type: none"> • Use theory in single-case studies • Use replication logic in multiple case studies 	<ul style="list-style-type: none"> • Use of multi-case design • Use of business units within same firm ensures a common set of external factors
Reliability	Demonstrating that the operations of a study – such as the data collection procedures, can be repeated, with the same results.	<ul style="list-style-type: none"> • Use case study protocol • Develop case study database 	<ul style="list-style-type: none"> • Data collection protocol developed based on results of earlier project • All electronic text sources of data compiled as Nvivo database • Process from collection to analysis detailed • Decision-making process for inclusion or exclusion of data made explicit

Source: Compiled by author. Based on format proposed by Yin (2003), p. 34

3.7 Chapter Summary

This chapter has explained the approach to the research and how it has been designed to ensure rigour, and that it derives the expected results. It also details the processes used during the collection and analysis of data. This ensures that the research is replicable and strengthens the validity of the results.

In the next section, I document on the first of 3 projects – an exploratory study of IT use within Caribbean firms. In addition to providing insights into how the firms were using IT, the study provided an empirical basis for deriving an instrument to be used to investigate IT use in greater detail, as was done in Chapter 5.

CHAPTER 4: EXPLORATORY STUDY OF IT USE BY CARIBBEAN FIRMS

4.1 Chapter Introduction

This chapter reports on an initial exploratory study on IT use by Caribbean firms. Section 4.2 outlines the purpose of the research project. Section 4.3 discusses the specifics of the research strategy and methodology, and in particular, the derivation of a suitable research framework. It expands on aspects of the discussion in Chapter 3 that were of specific relevance to this project.

Section 4.4 provides background information on the firms involved in the research and summaries of the interviews conducted as part of the research. Section 4.5 presents a cross-case summary based on the analytical framework while Sections 4.6 and 4.7 present discussions and conclusions emerging from the research.

Note that in the interest of readability, only the summaries of the data are presented in Section 4.4. **The detailed analysis of the interviews that was carried out in Project 1 is shown at Appendix F.**

4.2 Background and Purpose

The main purpose of undertaking Project 1 was to provide an initial set of findings to guide more in-depth research into IT use by Caribbean firms. This research primarily addressed Research Question (1): How are private sector Caribbean firms using Information Technology (IT) to assist in surviving the increasingly competitive business climate?

Given the limited availability of firm-level research on IT use in the Caribbean (as discussed in Chapter 2), one of the tasks for this project was to empirically investigate some of the arguments on which the justification for the research was based. Also, as discussed in Chapter 3, the research was conducted from an interpretive perspective (Blaikie, 1993), in which social reality is deemed to be constructed by the interpretations of the actors who are part of that reality.

While convincing arguments that support the premises of the research are available in the literature, it was necessary to determine the perceptions of the target firms with regard to these arguments. This is consistent with Klein and Myers' (1999) "Principle of "Dialogical Reasoning" which "requires the researcher to confront his or her preconceptions (Prejudices) that guided the original research design (i.e., the original lenses) with the data that emerge through the research process." (p. 76). In order to understand the "reality" of the respondents and target firms, a series of questions were developed to explore key assumptions of the research justification and to select specific issues for further in-depth investigation.

One of the main premises justifying the research was the argument that there was an urgent need for Caribbean firms to become more competitive. This was based on

arguments that the business environment is becoming more competitive for Caribbean firms, primarily due to changes in the global economic environment that lead to increased foreign competition (e.g. OECS, 2000; Wignaraja, 1999; World Bank, 2005b). It was therefore necessary to determine the extent to which the target respondents' perceptions were consistent with those arguments. This leads to the question:

- (a) What are the perceptions of the competitive environment among the respondents? Is it consistent with the arguments laid out, particularly with regard to the increasing importance of foreign competition?*

Further, several authors or institutions (e.g. Caribbean Development Bank, 2006b; Infodev, 2005; McIntyre, 2000; World Bank, 2006) have advanced arguments that IT will assist the Caribbean firms to respond to the perceived increase in competition. These arguments have been sufficiently persuasive for some governments to commit financial resources to stimulate increased use of IT by businesses (e.g. Government of Antigua and Barbuda, 2002; Government of Grenada, 2002). Therefore, it is necessary to determine whether the target firms consider IT to be playing a significant role in contributing to their competitiveness. This leads to the question:

- (b) Do respondents see IT as playing a significant role in establishing or maintaining their competitive position?*

Since the need to address competitive threats has been advanced as one of the main justifications for Caribbean firms to invest in IT. It is necessary to determine whether the target firms' current use of IT is directed towards addressing perceived competitive threats, or whether they were being used for more basic purposes. For example, the CARANA Corporation (2002) study found that in general, firms in St Lucia were mainly using IT for "rudimentary" purposes. This leads to the question:

- (c) To what extent (according to respondents' accounts) are the firms using IT in a manner that directly addresses the competitive threats?*

One of the intentions of the initial research is to develop an understanding of how IT is being used within the target firms, so that decisions can be made on the best approach for a more in-depth study. Thus this initial investigation needed to determine the general characteristics of IT use within the target firms. This leads to the question:

- (d) What is the general situation with regard to IT use within the firm, as respondents perceive it?*

In Chapter 2, the importance of internal characteristics of the firm, (as well as the importance of "context" were discussed. The importance of the role of management in determining the extent to which IT can deliver business value was also discussed (e.g. Mata et al, 1995). Based on these arguments, the attitudes of the management and other staff of the firms towards IT can be expected to be a significant determinant of

how and whether IT contributes to the firms' competitiveness. It is therefore necessary to develop an understanding of the attitudes of the management and staff of the target firms, leading to the following question:

(e) What are the attitudes of management and non-management towards IT?

Finally, this initial research is intended to provide a basis for further in-depth research to address the Research Questions. It is therefore important to identify further areas of investigation emerging from the findings. This led to the following question:

(f) What are the key areas and questions that need to be investigated further in order to address the core research questions?

4.3 Research Strategy and Methodology

4.3.1 Selection of Cases

This phase of the research was designed as an exploratory study to elicit views of managers on the use of IT within their firms. Consequently, the selection of the cases and the execution of the research were driven by a need to engage managers who were in a position to and were willing to articulate their views on the subject.

In selecting cases, the following criteria were used:

- Firms to be selected had to fall within the target defined in the research proposal, that is:
 - They had to have Caribbean ownership and originate in the Caribbean
 - They had to be involved in non-manufacturing activities³
 - They had to be involved in an area of business activity that was potentially exposed to competition from outside the Caribbean. While the focus for this study was businesses involved in the distributive trades (wholesale, retail, etc.) and in the financial services sector, it includes a firm providing engineering consulting services.
- Although size was not an explicit dimension of selection, an effort was made to identify firms whose size would give rise to sufficient complexity in IT use that a separate IT management function could be identified. As a deliberate exception however, a small owner-run firm was included to determine whether this would bring any significant insights to the process.

³ One of the firms included is a conglomerate that also owns manufacturing businesses. The majority of the firm's business is in non-manufacturing activities, however.

- The possibility of obtaining access to senior managers within the firm who would be willing to participate in an interview for the purposes of this research.

Initially, interviews were sought with a senior manager responsible for the firm's competitive strategy as well as the most senior manager directly responsible for the firm's IT. In 3 of the firms, both interviews were obtained while in the other 4 firms only one interview was conducted. In the latter case, 3 of the interviews were with the CEO or equivalent.

In summary, of the 10 interviews reported in this study, 3 were with IT managers, 4 were with CEOs or owner/managers of firms and the other 3 were with senior executives within the firm who had significant responsibility for competitive strategy. This summary is shown in Table 4-1.

4.3.2 Level and Unit of Analysis

The level of analysis for the cases reported in this document is the firm. The unit of analysis is the firm, with the individual manager as an *embedded* unit of analysis (Yin, 2003).

Table 4-1: Summary of interviews conducted

Firm	Primary Type(s) of Business	Persons Interviewed	Key Characteristics
A	Information and Communication Technology (Hardware, software and services)	Manager for Government services	Not a listed company but owned by two listed companies. Has operations in several Caribbean territories.
B	Import distribution and wholesale of a wide range of products. Also retail of stationery, computers, office machinery, office products and books	(1) Divisional Manager – Sales and Distribution (2) IT Manager	Public company. Approx 240 employees. Small IT operation (2 staff dedicated to IT). Has investments in similar firms in other Caribbean territories and in Miami (USA).
C	Conglomerate. Key businesses include Import Distribution, Automobile sales and service, car rental, Insurance, manufacturing, Airline catering	(1) Divisional General Manager – Manufacturing and Services Division (2) Group IT Manager	Relatively large. Divisional structure with Divisions (and some businesses within Divisions) relatively independent. IT staff both at Head Office level and within divisions. Significant business operations outside of home territory. Public company.

Firm	Primary Type(s) of Business	Persons Interviewed	Key Characteristics
D	Conglomerate. Key businesses include retailing (supermarkets), food import and distribution, insurance, automobile sales	(1) CEO (2) CIO	Relatively large (2700 employees). Diverse businesses. Currently reforming IT strategy. Relatively little business operation outside home territory at present. Public company.
E	Banking	CEO	Not a public company but owned by a public company. Approx 140 employees. CEO interviewed. Parent company is another Caribbean-owned financial services company.
F	Engineering Design Services	Owner/Managing Director	Small and growing professional services firm. 5 full-time employees (including owner). No in-house IT staff but relies on use of IT for all aspects of operations.
G	Banking	Managing Director (CEO)	Public company with approximately 70 employees. Has been in operation for about 70 years. Recently undertook major repositioning and restructuring, including significant investment in IT.

Source: Compiled by author

4.3.3 Development of Analytical Framework

4.3.3.1 Key Considerations

There are a number of studies that identify approaches to develop analytic frameworks for use in qualitative IS research. In reviewing and selecting approaches, particular emphasis was placed not only on the nature of the research or the arguments presented, but also on the context in which the research was carried out. Given that the combination of objectives and context in the research presented in this document is unique, the framework developed would of necessity have to combine elements from a number of different sources.

Caldeira (1998) and Caldeira and Ward (2002) report on factors affecting the varying levels of success in the adoption and use of IS/IT in Portuguese manufacturing Small and Medium-sized Enterprises (SMEs). The study develops and uses an analytical framework based on the work of Pettigrew et al (1989) and Pettigrew and Whipp (1991) in the field of strategic change. The framework analyses the data along four

main dimensions: Content, Internal Context, External Context and Process. This is shown in Table 4-2.

Table 4-2: Framework for collection and analysis of data on IT adoption and success

<p>1. Internal context</p> <p>1.1 Financial resources availability 1.2 Human resources 1.3 Management perspectives and attitudes towards IS/IT 1.4 IS/IT competencies 1.5 Power relationships 1.6 Users attitudes to IS/IT use 1.7 Position of the IS/IT manager in the organizational structure</p>
<p>2. External context</p> <p>2.1 IS/IT vendor's support 2.2 IS/IT external expertise available 2.3 Quality of the software available in the market 2.4 Business pressure to adopt and use IS/IT;</p>
<p>3. Process</p> <p>3.1 People involved 3.2 Frameworks and techniques and used in IS/IT development 3.3 IS/IT training 3.4 Stages followed in IS/IT development</p>
<p>4. Content</p> <p>4.1 Type of IS/IT solutions available in the firm 4.2 Objectives and assumptions about IS/IT 4.3 Evaluation of IS/IT benefits 4.4 Time of adoption</p>

(Source: Caldeira and Ward, 2002)

While Caldeira's framework at first appears to provide a suitable approach to analysing the data from the study being reported here, there were two important reasons why it could not be directly applied:

- Caldeira's (1998) study (and Caldeira and Ward, 2002, which is derived from it) was designed to focus explicitly on success factors for IT adoption and use in the defined context. The study reported here on the other hand does not have the same focus on success factors, aiming instead to identify broader issues surrounding the use of IT within the target organizations.
- There are some clear differences between the context of Caldeira's study and that of the one being discussed here. In particular, there are no obvious similarities between the geographical, social, cultural and economic environment of the Portuguese manufacturing SMEs that are the subject of Caldeira's study and that

of the Caribbean firms that are being studied here. Indeed, in discussing the context and rationale for the research (pp.1-5), Caldeira (1998) predicates much of the justification for the study on the perceived differences between the context in which other studies on IS/IT adoption and success have been carried out and that of the Portuguese manufacturing industries in which his study is being undertaken.

The issue of context is discussed by Avgerou (2001), who argues that it is of crucial importance that Information Systems (IS) research and practice associates technology innovation with the context within which it is embedded. She illustrates this with a case study of an effort at industrial reorganization in the island economy of Cyprus, examining in particular, the role attributed to Information and Communications Technology (ICT) in the reorganization process. The case discusses the reasons for the limited success obtained from efforts to emulate the model of “flexible specialization” used by networks of small producers in the Emilia Romagna region of Italy.

Avgerou (2001) develops a “contextual analysis” approach that identifies 6 types of influence on the organization change process that may be relevant to the study reported in this document. These are:

- (a) Technical/ rational ideas at the international level
- (b) Institutional influences at the international level
- (c) Technical/rational initiatives at the national level
- (d) Institutional influences at the national level
- (e) Technical/rational action at the organizational level
- (f) Institutional aspects at the organizational level

Avgerou (2001) also argues that “such analysis is particularly relevant for countries that pursue ICT-based development planning under the perceived imperatives of the global economy and by emulating other regions’ successful techno-economic policies” (p. 60).

Another stream of IS research literature that is potentially helpful to creating an analytical framework for this context is the “Stages of Growth” literature. Much of the interest in Stages of Growth models (SOGMs) in IS research can be attributed to the work of Nolan (1973, 1979) who proposed that the planning, organizing and controlling activities associated with managing the computer resource will change in character over a period of time. Nolan (1973) identified four stages of evolution while the refined model presented in Nolan (1979) identified six. Both of these models relied heavily on computer budget or expenditure as a determinant of the firm’s stage of evolution and one of Nolan’s principal assertions was that the budget curve representing IT expenditure through the various stages would be S-shaped.

Nolan’s models have been very influential in the IS research literature and Benbasat, Dexter, Drury and Goldstein (1984) undertook a review of empirical research that attempted to test them. While acknowledging that Nolan’s work was important in moving the IS field toward a sounder scientific footing through coherent explanation

of interrelated phenomena and assertion of testable hypotheses, Benbasat et al (1984) conclude that “the general conclusion of all the studies summarised here is that empirical support of the stage hypothesis is unconvincing” (p.484). King and Kraemer (1984) also argue that “the empirical bases of the model are questionable, and some evidence is available that they are factually mistaken” (p. 474).

Despite the strong criticisms reflected above, SOGMs appear to have strong appeal as both descriptive and predictive frameworks, and continue to be popular in IS literature. Galliers and Sutherland (1999), (which is reproduced from Galliers and Sutherland;1991), review some of the SOGMs that have been proposed in the literature (including Nolan’s (1979) model) and present a new six-stage model based on the “seven-S” framework used in the analysis of organizational processes. Galliers and Sutherland applied the model in the context of four Perth-based organizations and argue that “the model has proved useful not only in clarifying the location of each organization in IT maturity terms, but also in providing insights into aspects of IS management and planning which appear to require particular attention” (p. 54).

King and Teo (1997) develop a 4-stage model for the integration of Business Planning (BP) and Information Systems Planning (ISP). The model uses 10 benchmark variables to represent the stage of a firm within the model. This is tested through a questionnaire survey of 600 of the “top 1000 corporations in the USA” and the authors conclude that 7 of the 10 benchmark variables were validated as were the pervasive evolutionary patterns through the stages.

On the other hand, Levy, Powell and Yetton (2002) analyze two alternative models of IS-based strategic change – the Focus Dominance model and stages of growth models – as applied to SMEs. The authors conclude that the analysis of the outcomes of IS strategy development undertaken for 43 SMEs provides weak and incomplete support for a SOGM. Also, Doukidis, Lybereas and Galliers (1996) discuss the issue of development of IS planning in small businesses and the significance of SOGMs. That study refers specifically to Nolan’s (1979) six-stage model and the Galliers and Sutherland (1991) model and attempts to determine the validity of these models for 26 small firms in Greece. It concludes that the models do not satisfactorily explain the development of IS within these firms and argues that the models are unsuitable because they have been developed for the context of large firms in Western economies.

In addition to investigating respondents’ views on the use and role of IT within their firms, this study is also investigating their perceptions of the competitive environment. It is therefore necessary that the framework include a means of assessing these perceptions. While it has encountered much criticism over the years, Porter’s (1979, 1980) “Five forces model” remains one of the best known frameworks for analysis of the competitive environment. Thompson and Strickland (1987), summarise the five forces as follows:

- The jockeying for position among rival firms that flows from the strategic moves and countermoves to gain competitive advantage

- The competitive intrusions and threats from the substitute products of companies in other industries
- The potential entry of new competitors
- The economic power and bargaining leverage of suppliers
- The economic power and bargaining leverage of customers

Porter's framework has been used extensively in both the academic and practitioner literature on competition and strategy to analyse competitive threats and competitive positioning within firms.

4.3.3.2 Synthesis of initial framework

Given the foregoing, a framework has been synthesized to analyse the data from the study. In arriving at the framework, effort was made to reconcile the potentially conflicting objectives of being theoretically and empirically grounded, relatively straightforward and easy-to-use and suitable for the data to be analysed. This of necessity, called for certain compromises.

While the framework used in Caldeira (1998) and Caldeira and Ward (2002) was not entirely suitable for reasons discussed earlier, it is noted that this framework is based on an extensive review of the relevant literature as well as a detailed empirical study. The four dimensions identified – Internal Context, External Context, Process and Content provide a useful overall structure for categorizing the factors to be included in the analysis, even if the objectives of this study are different from that for which the model was originally created. This overall structure will therefore be adopted, with changes being made to the specific elements of the dimensions. Thus the analysis will attempt to determine the interrelationship between the context within which IT is being used within the firms, the process by which it is used (how selected, how implemented, how managed etc.) and the content (actual IT being used, its effect and outcomes, experiences with IT).

Within the dimensions of the Caldeira (1998) framework, the recommendations of Avgerou (2001) can be incorporated. Note however that the “organizational level” is already reflected in the Internal Context dimension, leaving the international and national levels to be incorporated into the External Context. In the interest of simplicity, no attempt is being made to specify “institutional influences”, “technical/rational influences” and “technical/rational actions” as part of the framework.

Initially, “competitive environment” was included as a component of the External Context, and further subdivided into five sub-components reflecting Porter's Five Forces model. Pre-testing with a sample of the data and comparison to the Interview Protocol showed this to be unsuitable however, and it was dropped. Instead, the competitive environment is included in the External Context dimension through 3 components – source of threat, nature of threat and level of threat.

Although SOGMs continue to be popular and hold considerable intuitive appeal, the stage of growth or “maturity” concept has been left out of this framework. There are two main reasons for this:

- (a) As the earlier discussion illustrated, there seems to be considerable difference of opinion in the academic literature on the usefulness of such models. The empirical data on the extent to which the model reflects real situations is inconclusive and it appears that these models are particularly sensitive to the context in which they are derived and used.
- (b) This study, with its focus on managers’ views, has not attempted to identify the range of organizational factors such as IT budget and range of applications used, in the level of detail that would support classification on a SOGM.

While SOGMs have been left out of the research framework, the associated concept of maturity remains relevant in interpretation of the results.

4.3.3.3 List of Codes in initial framework

Figure 4-1 summarises the initial framework developed. These were setup in the *Nvivo* qualitative data analysis software package (Richards, 1999) for the next phase of the analysis of the data. The table shows the *Nvivo* codes corresponding to this framework.

It is anticipated that as the document coding is done, the framework reflected by this coding will need to be revised to ensure that it adequately accommodates what is revealed by the data.

Nodes in Set: All Tree Nodes	
Number of Nodes:	37
1	(1) /Internal Context
2	(1 1) /Internal Context/Resources
3	(1 2) /Internal Context/Management attitudes
4	(1 3) /Internal Context/IS-IT competencies
5	(1 4) /Internal Context/organizational structure
6	(1 5) /Internal Context/Position and role of IT Manager
7	(1 6) /Internal Context/Other Internal Context
8	(1 7) /Internal Context/Expectations from IT
9	(2) /External Context
10	(2 1) /External Context/Level of threat
11	(2 1 1) /External Context/Level of threat/Significant
12	(2 1 2) /External Context/Level of threat/Not significant
13	(2 2) /External Context/Caribbean context
14	(2 3) /External Context/non-Caribbean context
15	(2 4) /External Context/Technology
16	(2 5) /External Context/Other External Context
17	(2 7) /External Context/Source of threats
18	(2 7 1) /External Context/Source of threats/Caribbean

19	(2 7 2) /External Context/Source of threats/non-Caribbean
20	(2 8) /External Context/Nature of threats
21	(2 8 1) /External Context/Nature of threats/New threat
22	(2 8 2) /External Context/Nature of threats/Existing threat
23	(2 8 3) /External Context/Nature of threats/Changed threat
24	(3) /Process
25	(3 1) /Process/IS-IT development over time
26	(3 2) /Process/How IT Managed
27	(3 3) /Process/How IS-IT Deployed
28	(3 4) /Process/Other Process
29	(3 5) /Process/IT Role
30	(4) /Content
31	(4 1) /Content/IT Applications available
32	(4 2) /Content/Benefits realized from IT
33	(4 3) /Content/Experience with IT to date
34	(4 4) /Content/Other Content
35	(4 5) /Content/Unrealized benefits
36	(4 6) /Content/IT successes
37	(4 7) /Content/IT failures

Figure 4.1: Initial Nvivo Node Structure (Source: Compiled by author)

4.3.3.4 Evolution of the research framework

While the analytical framework described in the previous section provided the basis for approaching the analysis of the data, the framework itself evolved significantly during the actual analytical process. Given the intention of the research to identify factors that may need to be further investigated, the process of analysis and the refinement of the data required that a balance be struck between finding concepts that may become significant on one hand, and keeping the framework relatively simple on the other.

The practice adopted therefore, was to create new codes when new concepts, ideas or terms seemed to emerge from the data, and subsequently to review the codes for similarity in order to condense them into more meaningful categories. This approach was informed by *Grounded Theory* (Glaser and Strauss, 1967; Strauss and Corbin, 1998), as discussed in Section 3.5.2.

The above process resulted in the creation of new nodes, the removal of some nodes and changes to the meaning of some other nodes. The net effect however, was to increase the total number of elements in the analytical framework. The main changes made to the framework are summarised below. Table 3 provides a summary of the elements of the revised analytical framework. Note that the order of presentation is not significant.

Internal Context

During analysis of the data, several additional points emerged that appeared relevant in determining how the internal context affected the use of IT. Those appearing to merit identification as separate points within the framework were:

- Sources of competitive advantage
- Effect of the age of staff (management and non-management)
- Source of IT impetus within the firm - who within the firm was driving the IT agenda
- Other internal constraints - various technical, human resource or other factors within the firm that were inhibiting its use of IT

The data did not point to the “Role and Position of the IT Manager” as an issue that stood out, so it was decided that the concept would be incorporated under “organizational structure”. It was therefore removed as a separate category.

In light of the expanded coding, “Other Internal Context”, which was included to catch other internal context factors that were not otherwise classified, became unnecessary and was dropped.

External Context

There were some minor changes in the coding for External Context:

- “Nature of Threats” was changed to “Changes in Competition” as that label better reflected what coding at this node was intended to capture - perceived changes in the competitive environment.
- “Source of threats” was relabelled “Sources of Competition”
- “Technology” was relabelled “Technology effects” to better reflect what this node was intended to capture - instances where the availability or use of technology by others was perceived to be affecting the competitive environment.
- “Consumer behaviour” was added to capture instances where changes in consumer or customer behaviour were perceived to have an effect on the external environment
- “Availability of external support” was added to capture instances where the availability of the necessary technical capability for implementation or support of IT outside the firm was perceived to be a factor in determining the firm’s use of IT
- “Comparison of IT to competitors” was added to capture instances where interviewees explicitly compared their use of IT to that of competitors, especially if they considered it to be a factor in determining their competitive position.
- “Competitors’ advantage” was added to capture instances where respondents identified factors that they considered to give their competitors a specific advantage.

- “Government policy and action” was added to capture instances where government action and policies were perceived to affect the use of IT. This includes factors such as government’s own use of IT, legislation, national policies on IT use or other actions on the part of government that affected the firm’s competitive environment and particularly its perceptions on the use of IT.
- “Regional and International context influences” replaced the separate elements of “Caribbean context” and “non-Caribbean context” from the initial framework. This is intended to capture other external context factors within and outside the Caribbean emerging from the interviews that appear to have some relevance. An example is one interviewee’s assertion that governments in the Caribbean account for about 20 percent of employment.
- “Public perceptions and expectations” was added to represent instances where public perceptions or expectations, particularly with regard to IT use, was seen as a factor in determining IT use or in the success of IT use.
- “Other external constraints” was added to capture additional factors in the external environment that emerged as potential constraints on the firms, particularly with regard to their use of IT.
- With the expanded list, there was no longer a need for the generic “Other external context”.

Process

The following changes were made to the “Process” dimension of the analytical framework:

- “Competitive responses” was added to capture what the interviewees reported that the firms were doing or needed to do to respond to the competitive challenges faced.
- “Business and IT strategy” was added to capture what interviewees reported with regard to the existence and execution of business and IT strategies within their firms
- “Improving benefits from IT” was introduced to capture instances where participants identified specific actions that their firms were taking, planned to take or needed to take to improve the benefits they derived from IT
- “Staff training” was introduced to capture instances where interviewees discussed specific training activities to improve the competence of staff to use IT

Content

The following changes were made to the “Content” dimension of the analytical framework

- “Unrealized benefits from IT” was relabelled as “Potential or unrealized benefits” to capture instances where interviewees were able to identify specific benefits that could be derived from IT but were not being derived, as well as instances where expected benefits had failed to materialize.
- “IT failures” was relabelled “IT difficulties” since it seemed to better capture the difficulties that interviewees identified with their IT. During the interviews, respondents generally did not classify IT activities as “failures” but instead spoke of difficulties that they experienced.
- “Other content” was dropped.

4.3.3.5 Other Considerations

After coding an initial set of interviews, there was a considerable amount of intersection between “Expectations of IT” (Internal context) and “Role of IT” (Process). While both of these categories seem quite important in themselves, the overlap suggested that one of them might be redundant.

A possible explanation is the fact that “Expectations of IT” is intended to represent what respondents say they believe IT can do for the firms while the “Role of IT” is intended to represent what part IT plays in the firm’s success or operation. Thus the “Expectations of IT” are based on respondents’ views and desires, while “Role of IT” is based on actual use of IT and is therefore more factual. The research design for this project however does not provide for making factual determinations beyond the responses provided by the interviewee, therefore leading to the overlap.

While both categories have been retained in the analysis for the time being, consideration may be given to merging them into the “Expectations of IT” category of the “Internal context”.

4.3.3.6 Revised Analytical Framework

Table 4-3 summarises the revised analytical framework.

Table 4-3: Summary of Revised Analytical Framework

Internal Context	
Resources	Resource availability and indications of effects of resource availability on IT use and competitive position
Management attitudes	Characterizations of the attitude of management towards IT within the firm

Staff attitudes (non-management)	Characterizations of the attitude of staff (other than management) towards IT within the firm
IT competencies	Competence in IT implementation and use existing within the firm - particularly those that affect the firm's disposition towards IT.
Organizational structure	Characteristics of the organization's structure, with particular emphasis on how this relates to the way IT is managed and used.
Sources of competitive advantage	Indications of specific attributes of the firm that were perceived to provide competitive advantage
Expectations from IT	Expected contributions of IT to the firm (and particularly to the firm's competitiveness) as identified by interviewees.
Effect of age of staff	Specific indications that interviewees believed the age of members of management or staff was a factor contributing to their attitudes and disposition towards IT.
Sources of IT impetus	Indications of who in the firm "drives" the IT
Other internal constraints	Various technical, human resource or other factors within the firm (other than those specified above) that inhibit its use of IT
External Context	
Level of threat <ul style="list-style-type: none"> ▪ Significant ▪ Not significant 	Whether or not a particular competitive threat is significant. This is intended as a qualifier for "Sources of competition" and "Changes in competition"
Sources of Competition <ul style="list-style-type: none"> ▪ Caribbean ▪ Non-Caribbean 	Indications of where participants see their main competition coming from, and in particular, whether this competition is from within or outside the Caribbean
Changes in competition <ul style="list-style-type: none"> ▪ New threat ▪ Existing threat ▪ Changed threat 	The extent to which the competitive threats faced by the firms are perceived as being existing threats, new threats or threats which have previously existed but have now changed, for example have become more intense or are manifesting themselves in different forms.
Regional and International context influences	This is intended to capture other external context factors within and outside the Caribbean emerging from the interviews that appear to have some relevance. An example is one interviewee's assertion that governments in the Caribbean account for about 20 percent of employment.
Technology effects	Perceived effects of the use of technology by others on the firm's competitive environment.
Consumer behaviour	Changes in consumer or customer behaviour that are perceived to have an effect on the external environment.
Availability of external support	Indications that the availability of the necessary technical capability for implementation or support of IT outside the firm was perceived to be a factor in determining the firm's use of IT.
Comparison of IT to competitors	Comparisons that interviewees made between their use of IT and that of others, especially competitors, particularly where this is perceived as being a factor in determining their competitive position.
Competitors' advantage	Interviewees' indications of factors that they considered to give their competitors specific advantages.
Government policy and action	Instances where government action and policies were perceived to affect the use of IT. This includes factors such government's own use of IT, legislation, national policies on IT use or other actions on the part of government that affected the firm's competitive environment and particularly its perceptions on the use of IT.

Public perceptions and expectations	Instances where public perceptions or expectations, particularly with regard to IT use, was seen as a factor in determining IT use or where the public's perception of the firm's use of IT was seen as affecting its competitive position.
Other external constraints	Additional factors in the external environment that emerged as potentially being a constraint on the firms, particularly with regard to their use of IT.
Process	
How IT developed over time	Indications of how the firm has acquired and implemented its IT resources over time, including any indications of specific stages that it may have gone through.
How IT managed	Respondents' accounts of processes for the management of IT within the firm
How IT deployed	Respondents' accounts of how IT is typically deployed within the firm with particular emphasis on processes involved and why these processes are used.
IT Role	The role that plays within the firm, particularly with regard to supporting the firm's competitive position.
Competitive responses	What the interviewees reported that the firms were doing or needed to do to respond to the competitive challenges faced.
Business and IT strategy	What interviewees reported with regard to the existence and execution of business and IT strategies within their firms
Improving benefits from IT	Identification of specific actions that their firms were taking, planned to take or needed to take to improve the benefits their derived from IT
Staff training	Identification of specific training activities that firms undertook to improve the competence of staff to use IT
Content	
IT applications available	Identification of the IT applications available to the firm to carry out its activities
Extent of IT use	Indications of the extent to which IT is being used within the firm, both in terms of the number of persons using IT and the purposes for which it is being used.
Benefits realized from IT	Specific benefits that respondents identify as being attributable to the firms' use of IT.
Experience with IT to date	General indications of the firms' experience in using IT to date, that are not sufficiently specific to be classified as successes or difficulties.
Potential and unrealized benefits	Identification of specific potential benefits that respondents believe the firm could derive from its available IT resources but does not, or has not yet derived.
IT successes	Instances where respondents explicitly identify implementation of IT as being successful or very beneficial.
IT difficulties	Instances where respondents identify specific difficulties encountered in implementing or using IT.

Source: Compiled by author

4.3.3.7 Nvivo Node Structure for Revised Analytical Framework

Figure 4-2 shows the Nvivo node structure corresponding to the analytical framework described.

Note the following:

- The coding has been done along the second level of nodes (e.g. Management attitudes, etc.). While in some case there is a third level of nodes, these have been included to facilitate the analysis process in Nvivo and to make it easier to identify patterns in the data. They are not intended as separate categories.
- One category – level of threat, was included specifically to facilitate classification and searching in Nvivo, and is not a separate element of the analysis. It therefore does not appear in the case summaries that follow.

NODE LISTING

Nodes in Set: All Tree Nodes

Number of Nodes: 57

1	(1) /Internal Context
2	(1 1) /Internal Context/Resources
3	(1 2) /Internal Context/Management attitudes
4	(1 2 1) /Internal Context/Management attitudes/Enabling
5	(1 2 2) /Internal Context/Management attitudes/Inhibiting
6	(1 3) /Internal Context/IT competencies
7	(1 4) /Internal Context/organizational structure
8	(1 5) /Internal Context/sources of competitive advantage
9	(1 7) /Internal Context/Expectations from IT
10	(1 8) /Internal Context/effect of age of staff
11	(1 10) /Internal Context/non-management staff attitudes
12	(1 15) /Internal Context/Source of IT impetus
13	(1 20) /Internal Context/Other internal constraints
14	(2) /External Context
15	(2 1) /External Context/Sources of Competition
16	(2 1 1) /External Context/Sources of Competition/Caribbean
17	(2 1 2) /External Context/Sources of Competition/non-Caribbean
18	(2 2) /External Context/Changes in Competition
19	(2 2 1) /External Context/Changes in Competition/New threat
20	(2 2 2) /External Context/Changes in Competition/Existing threat
21	(2 2 3) /External Context/Changes in Competition/Changed threat
22	(2 3) /External Context/Level of threat
23	(2 3 1) /External Context/Level of threat/Significant
24	(2 3 2) /External Context/Level of threat/Not significant
25	(2 4) /External Context/Technology effects
26	(2 6) /External Context/consumer behaviour
27	(2 9) /External Context/availability of external support
28	(2 10) /External Context/comparison of IT to competitors
29	(2 11) /External Context/competitors' advantage
30	(2 12) /External Context/government policy and action
31	(2 13) /External Context/Regional and Int Context influences
32	(2 13 2) /External Context/Regional and Int Context influences/Caribbean

context	
33	(2 13 3) /External Context/Regional and Int Context influences/non-Caribbean context
34	(2 16) /External Context/public perceptions and expectations
35	(2 18) /External Context/Other external constraints
36	(3) /Process
37	(3 1) /Process/IT development over time
38	(3 2) /Process/How IT Managed
39	(3 3) /Process/How IT Deployed
40	(3 5) /Process/IT Role
41	(3 6) /Process/Competitive Responses
42	(3 6 1) /Process/Competitive Responses/CR - new product development
43	(3 6 2) /Process/Competitive Responses/CR-consolidation of activities
44	(3 6 3) /Process/Competitive Responses/CR-focus
45	(3 6 4) /Process/Competitive Responses/CR-geographical scope
46	(3 6 5) /Process/Competitive Responses/Improving resources and processes
47	(3 8) /Process/Business and IT strategy
48	(3 9) /Process/Improving benefits from IT
49	(3 10) /Process/staff training
50	(4) /Content
51	(4 1) /Content/IT Applications available
52	(4 2) /Content/extent of IT use
53	(4 4) /Content/Benefits realized from IT
54	(4 6) /Content/Potential or unrealized benefits
55	(4 10) /Content/Experience with IT to date
56	(4 18) /Content/IT successes
57	(4 20) /Content/IT difficulties

Figure 4-2: Nvivo Node listing for revised framework (Source: Compiled by author)

4.4 Case Summaries

4.4.1 Overview

This section presents a summary of the interviews based on the analytical framework described earlier.

4.4.2 Firm A

4.4.2.1 Firm A - Background

Firm A is an Information Technology services company. The interviewee described himself as being responsible for the firm's Government market within the Barbados office. He had been with the firm for 2 years at the time of the interview, in that position.

The firm, which has been in the IT business for many years, was recently restructured to integrate the various IT-related business units of its parent company. This included a total of 7 companies operating in 5 Caribbean territories. The parent company, which owns approximately 80% of Firm A, is a relatively large Caribbean conglomerate with headquarters in Trinidad and Tobago and operations in several other Caribbean territories.

According to the interviewee, the firm has a staff of approximately 600 and is his view, that possibly made it the largest Caribbean-based IT vendor. (This represents the total for the firm, not just the Barbados office). It currently uses a matrix structure with the vertical components representing specific market segments such as Government, Financial Services, Hospitality and Utilities, and horizontal segments representing specific technologies and applications such as Geographic Information Systems (GIS) and Education systems.

The firm offers a range of IT products and services, including computer hardware, software, telecommunications equipment and related services. It represents several international brands including Compaq, Microsoft, Oracle, Motorola and Avaya. According to the firm's website, its vision is "to be the leading Caribbean-based provider of Information and Communications Technology and Services solutions Worldwide".

4.4.2.2 Interview 1: Firm A – Head of Government Services

During the discussion the interviewee portrayed the firm as one that had a well-organized business and IT strategy and one that derived significant competitive benefit from IT. The various elements of the Internal Context seemed well aligned towards this – senior management not only supported but were proactive in promoting IT use within the firm; the firm had a high level of competence in IT, partly derived from its interaction with other vendors and partners; staff were both highly supportive

of and highly skilled in IT use; and there were generally high expectations of the ability of IT to contribute to the firm's competitiveness.

The interviewee considered the main competitors to be traditional large foreign-based IT service providers that operate in the Caribbean on a regional scale. He did not consider smaller local firms to be a significant factor. He acknowledged however, that non-Caribbean firms with no established base in the region were becoming more of a competitive factor, although he did not consider this significant.

The firm had two main competitive responses to the perceived changes in the competitive environment. One was to restructure itself so that it could compete more effectively on a regional scale and the second was to change the nature of its engagement with its business partners so that there was more opportunity to increase its own capabilities through technology transfer.

Although the interviewee reported that there was an "operations group" that was responsible for internal operations including IT, and that there were staff dedicated to provision of internal IT services, he did not make it clear how internal IT services were managed. In particular, it remained unclear where the decision-making responsibility lay for matters related to internal IT. It was also noted that although he initially stated that the staff were dedicated to internal operations, he later indicated that they were also used to provide services to clients.

Levels of IT use within the firm were high, with "almost everything" being automated and a very high ratio of computer stations to staff. The role of IT was that of an "enabler" – providing the firm with a "platform" that would enable it to be more competitive.

In general, the interviewee's responses suggest that the firm is effectively using IT to support its competitive position, and that it is deriving the benefits it expects from IT. The firm's position as a provider of IT services and internal IT capabilities contribute to this.

While the four dimensions of the analysis (Internal Context, External Context, Process and Content) are consistent with each other, the lack of specific examples and illustrations does raise some questions. The main cause for concern is the fact that the interviewee represents an IT services firm, and as such, may have been inclined to portray IT in the most favourable light.

4.4.3 Firm B

4.4.3.1 Firm B - Background

Firm B is primarily an import distribution company, whose main business is the importation of a wide range of products for sale to retailers such as supermarkets. It is involved, to a lesser extent, in Insurance, computer sales and stationery retail. It is part

of a network of similar companies operating in several Caribbean territories and has a staff of approximately 240 persons.

Separate interviews were held with IT Manager and the Director responsible for Marketing and Distribution. The IT Manager, who has day-to-day responsibility for the firm's computer systems, reports to the Financial Director.

The Director responsible for Marketing and Distribution is part of the executive management of the firm and had been with the firm for 16 years, but in the current position only for 4 years at the time of the interview.

4.4.3.2 Interview 2: Firm B – Director for Marketing and Distribution

The interview suggests that several factors in the Internal Context are inhibiting the use of IT. Much of this seems to stem from weak management support for the use of IT, which the interviewee attributes partly to their age.

The weak management support for IT manifests itself in a lack of clarity on where the impetus for IT within the firm should come from and who should be driving IT. The interview suggests there is no “champion” for IT, with neither the supply side nor the demand side taking a proactive position in promoting increased IT use throughout the firm.

It was also noted that while the firm considered its larger size relative to several of its competitors and its “full infrastructure” to be among its sources of competitive advantage, there is no indication that it is using IT in a way that would leverage those advantages. Indeed, the interviewee's comments indicate that the smaller competitors are able to make more effective use of IT.

The interviewee was able to articulate a clear view of the nature of the competitive environment – who the main competitors were, the relative importance of the different categories of competitors and how the nature of competition was changing. Local competitors seemed to represent the most significant competition, although he acknowledged that foreign competition was increasingly becoming a factor.

Changes in consumer behaviour, facilitated by access to the Internet, was also leading to changes in the competitive environment with consumers increasingly able to bypass local vendors and purchase directly from foreign competitors. This had proven to be particularly important in the used car and computer markets.

The interviewee acknowledged that the firm's competitors, both the smaller local ones and the foreign one, may be able to derive competitive advantages by virtue of more effective use of IT, particularly in generation and use of sales information.

There was no indication that the firm had a formally articulated business strategy. However, the interviewee was able to articulate clearly and concisely, how the firm intended to respond to changes in its competitive environment. The principal

strategies were to increase its geographical scope of operation through establishment of a North American base and collaboration with its partners in the regional network, and to “divisionalize” its operations to allow it to better focus on each of its products lines.

Despite the clear articulation of the competitive response, there was no corresponding articulation of the role of IT in supporting that response. The main role envisaged for IT was in generally improving the availability of sales and marketing information to support the various competitive strategies.

The extent of IT use and range of applications appears to be limited. Most of the discussions focussed on a particular application that provided functions for inventory management, sales and billing. There was also some discussion of the use of presentation software. As a caveat however, it should be pointed out that the interviewee, as Director for Sales and Marketing, chose to focus only on applications of interest to him and ignored others, for example, accounting applications.

Despite the importance of inventory management to the operations of the firm, as emphasised during the interview, it was noted that use of the inventory management application had not been extended to receiving at the warehouse, creating some difficulties.

In general, several of the above elements particularly lack of senior management support for IT, ambiguity in the source of IT leadership, the apparently limited range of IT applications, the focus on operational level IT use and the perceived benefit of relatively simple IT applications, suggests that IT within the firm is at a relatively early stage of maturity. This view is further reinforced by the fact that the interviewee believes that one of the major obstacles to greater IT use is getting the users to appreciate what IT can do for their work.

4.4.3.3 Interview 3: Firm B – IT Manager

Viewed from the perspective of the IT Manager, the Internal Context is an inhibiting factor in the use of IT. While some of his statements about management attitudes are somewhat contradictory, the overall indication is that IT is considered important only from an operational perspective. Further, the organizational structure and management processes do not appear to give great prominence to the IT function. The IT Manager reports to the Financial Director and appears to have little influence in high-level IT planning activities, such as budgeting. It was notable that the IT Manager could not say definitively whether or not there was an IT budget.

The view that the IT Manager’s influence is limited is further supported by his apparent limited awareness of the firm’s external environment and the nature of its competition. While he was able to give general indications of the nature of the competition and changes in the competitive environment, he was not able to articulate this with any great degree of specificity.

The main role of IT identified during the interview was that of providing operational support for the sales, billing and inventory management functions within the firm. The IT Manager believed that the existing system had the capability to provide information to support better decision-making, but that this capability was under-utilized, largely because the potential users were not aware of the capabilities or how to take advantage of them. There seemed to be some ambivalence however, as to who should take the lead in bringing about the changes in attitude and knowledge that would allow the firm to take advantage of these capabilities.

The general impression derived from analysis of this interview is that within the firm, IT is still viewed primarily as a tool for providing basic operational support rather than as strategic resource. It appears that the IT manager is fulfilling a primarily technical function in making the IT resources available for use, and has little influence beyond this.

4.4.4 Firm C

4.4.4.1 Firm C - Background

Firm C is a conglomerate involved in several different types of business activity, the key ones being:

- Import distribution
- Manufacturing
- Airline catering
- Automobile Sales and Rental
- Insurance (non-Life)
- Retail

The firm is structured in 3 divisions as follows:

- **Airline catering.** The businesses in this division provide catering services to airlines. Of the 3 divisions, this one has the most geographically diverse operations, having operations in several English-speaking Caribbean territories as well as in St Maarten, El Salvador, Guatemala, Venezuela, Colombia, Ecuador, Paraguay and Uruguay.
- **Import Marketing and Distribution.** The businesses in this division are traditional import businesses, including auto sales and service. Businesses in this division have operations in Antigua and Barbuda, Barbados, St Lucia and St Vincent and the Grenadines. One of the interviewees (the Divisional General Manager referred to below) also stated that an operation was due to open in Grenada shortly.
- **Manufacturing and Services.** This was described as including 12 companies involved in businesses that ranged from “meat processing to bakery to shrimp and fish processing in Guyana to rum distillery to different things”. While this division

is dominated by manufacturing operations, it also includes services such as Insurance (non-life).

Each division is headed by a Divisional General Manager, who reports to the Managing Director.

Interviews were held with the Group IT Manager and with the Divisional General Manager (DGM) for the Manufacturing and Services division. The DGM, as a senior executive, was in a position to speak on behalf of the firm in general and not just for his division.

The DGM has been with the firm for 13 years, and had been in the DGM position for 7 years at the time of the interview.

The firm is a publicly traded company, and has been in existence for approximately 80 years. It was originally family-owned, and according to the DGM, the founding family still owns approximately 60 percent of the shares. He stressed however that it was no longer run as a family business and that only one of the firm's executives, the Managing Director, was from the founding family.

The annual turnover is of the order of US \$175 million. According to the DGM, approximately 50 percent of the firm's business, by assets or revenue, is in Barbados while the balance is spread among the other 15 Caribbean and Latin American territories in which it operates.

The DGM indicated that within his division, each subsidiary company was "self-contained", with its own General Manager, and depending on its size and type of business, other types of staff such as accounting, sales and production. He described the management of the firm as being "relatively decentralized", with each company being a stand-alone unit. The firm also had "fairly extensive guidelines" to provide commonality in a range of matters such as human resource management policies, financial management guidelines and operational procedures.

4.4.4.2 Interview 4: Firm C – Divisional General Manager

Perhaps the two key characteristics of the Internal Context for Firm C, which impact several of the elements reviewed in the analysis, are the disparate nature of its businesses and the decentralized nature of its management. Also important is the fact that it has had a significant amount of business outside of its home territory and indeed outside of the Caribbean for some time.

The attitude of management and staff towards IT seems generally positive, although the discussion did not point to an enthusiastic push for greater IT use from the management level. It is recognized however, that within the firm, much of the decision making on IT takes place at the subsidiary company level and therefore the question of attitude towards IT may be more significant there than at the Head Office level.

The disparate nature of its businesses and the geographical scope within which they operate, mean that Firm C has several types of competitors in different territories. It had also been exposed to non-Caribbean competition for some time. Nonetheless, the DGM was able to identify several changes in the competitive environment that were affecting the firm. One of the most significant developments with regard to non-Caribbean competition was the auto sales market where traditional dealers, including Firm C, had lost considerable market share because consumers were able to import used cars directly from outside the region, using the Internet.

The DGM did not indicate that IT gave his firm any specific advantage over its competitors. He also did not give specific indications that better IT use was an advantage for any of the competitors. He did acknowledge however, that the firm was probably behind its non-Caribbean competitors in the use of IT. He also felt that his firm could not be competitive without IT, and that IT was critical to its survival.

Because of the organization's structure, the firm has adopted a partly centralized and partly decentralized IT management arrangement. The largest subsidiaries within the Group have in-house IT specialists, albeit at a technical level, while the others are supported from Head Office. It was not clear how much influence the Head Office IT staff have on the IT policies and decisions of the subsidiary companies and to what extent they were involved in "driving" IT in these companies.

There appears to be limited strategic planning at the Head Office level, pertaining mainly to financial performance targets. IT strategy is not addressed at that level. This situation seems generally consistent with the picture of decentralized IT decision-making painted by the discussion.

The primary uses of IT appear to be operational, focusing on general applications such as accounting, sales and billing, as well as operational support for the different types of businesses – for example, manufacturing. The main exception appears to be the use of Lotus Notes for groupwide communication and collaboration. Introduction of this product seems to have brought significant benefit to the firm beyond what one would expect from simply computerizing a similar manual system.

The DGM's view of the firm's experience with IT was generally positive. While acknowledging that a few projects were "money down the drain", he did not give any indication that those failures had an overall negative impact on the views of IT.

It is somewhat difficult to discern from this interview what the general level of IT use is within the firm and what the overall state of maturity is, because much of the IT-related activity is decentralized and different subsidiaries can be at different levels or stages. Nonetheless, the DGM paints a picture of a generally stable situation where the firm is making reasonably good use of the resources available.

There are no specific indications that the firm has made specific efforts to use IT to directly address the changes in the competitive environment enumerated by the DGM.

His statements reveal however, that at the senior management level, there has been some recognition that there are more benefits to be derived from proactive use of IT and that specific action may need to be taken to address these benefits. One of the options mooted was to hire an individual specifically to research opportunities for making greater use of IT.

4.4.4.3 Interview 5: Firm C –Group IT Manager

From the discussion with the IT Manager, the organizational structure of the firm emerged as an overarching factor affecting IT use. One of the most significant considerations was that despite the existence of a Group IT department, much of the decision-making on IT investments took place at the individual company level. This appeared to constrain the influence of the Group IT Manager, making the structure an inhibiting factor in IT use.

The IT Manager considered the attitudes of management at the Head Office level towards IT to be generally positive, but those of management at the individual company level, where the decisions were made, were much less so. Further, it was not clear that any particular entity, either at the Head Office or company level, was responsible for driving the IT agenda.

The diversified nature of the firm's operations meant that it had different types of competitors, and the IT Manager did not offer a generalized summary of the nature of competition. He did allude however, to specific types of business – namely the automobile dealership and the food distribution business, where competition had become much more intense in recent years. In both cases, the increased competition was at least partly due to local customers purchasing directly from non-Caribbean suppliers instead of through his firm. He also identified some external constraints that inhibited the firm's use of IT to improve its competitive position. One of these was the firm's concern that it would be competing with its international distributors if it used the Internet for export sales. Another was the high telecommunications costs that negated some of the potential benefits of electronic collaboration methods.

While the IT Manager indicated that the firm had a documented IT Strategy, his statement that it was “outdated” and the lack of any reference to it suggested that he did not regard it as providing useful guidance in making and implementing IT decisions. Further, the discussion about the Group IT function alluded to technical support for the various business units but gave very little indication of a strategic role in directing the firm's overall IT activities.

There appears to be a significant use of IT for typical operational purposes throughout the Group. The firm also uses a group-wide e-mail and collaboration system. It appears that overall however, the IT Manager believed that the firm was not making as much use of its available IT resources to support or improve its competitive position.

4.4.5 Firm D

4.4.5.1 Firm D - Background

Firm D is a conglomerate and is involved in several different types of business including:

- Import distribution
- Retail (supermarkets ..)
- Automobile sales
- Insurance
- Hotels
- Shipping

Interviews were held with the CEO and the CIO. The CEO had been with the firm for about 3 years at the time of the interview. The CIO had been with the firm for about 15 months.

4.4.5.2 Interview 6: Firm D - CEO

From the interview, it was evident that the CEO had great confidence in the ability of IT to contribute to the firm's competitiveness and he explicitly identified increased use of IT as one of the strategies that were being pursued in order to address the perceived increased threat from non-Caribbean competitors.

Within the senior management of the firm, there was support for the IT thrust. There also appeared to be good receptivity to the introduction of IT at the non-management levels. Interestingly however, the middle management the group that was of most concern to the CEO, with their inability to effectively use the available IT tools emerging as a bottleneck. This was being addressed to some extent by training, and the CEO reported that there were "immediate results" in cases where managers had been trained to use systems properly.

The CEO gave some indication of specific IT systems that had been or were being implemented to bring about the desired benefits. There was a focus on systems to support greater integration, communication and collaboration throughout the firm. He did not however, offer specifics on how the IT investments would bring about the improvements. His statements pointed to an expectation that increased use of IT would bring about improved efficiency, improved information, better decision-making and consequently increased competitiveness.

In general however, with regard to the Internal Context, the firm appeared disposed towards increased use of IT to support competitiveness. While it is not possible to determine how successful the firm's IT efforts have been to date, one can conclude from the discussion that the CEO was using his influence to promote use of IT as a competitive tool.

4.4.5.3 Interview 7: Firm D - CIO

The CIO created the impression of a firm that had pursuing a deliberate strategy of strengthening its Internal Context to allow it to take greater advantage of IT to respond to perceived changes in the competitive environment. Senior management appeared highly supportive of IT, due in part to the influence of the CEO who had a strong personal appreciation of the value of technology.

The firm had clear expectations that IT would allow it to become more competitive, primarily by allowing it to become more efficient and productive, including controlling costs and helping to speed up operations. The CIO believed that the firm had already derived competitive advantage from its investment in IT, alluding to its success so far in surviving while other local competitors were “on the verge of going out of business”.

One of the most significant observations in that regard is that the senior management seem to be very supportive, with the CEO championing the cause.

While the firm is a conglomerate with several independent businesses in different industries, it had been able to devise an IT management structure that was a hybrid of centralization and decentralization – it allowed the CIO at head office level to provide strategic direction and general oversight for IT throughout the firm, while allowing individual businesses to make their own IT decisions and manage their own IT resources on a day-to-day basis.

Since the firm is a conglomerate operating in different industries, the CIO did not consider it to have specific “key competitors”, but believed that it was particularly vulnerable to foreign competition in the “food group” businesses and the automobile sales business. In the former, competition was made more intense by the entry of North American retailers into the local market. In the latter the firm’s market share had been significantly eroded by the importation of used cars facilitated by IT use (in the form of the Internet), by foreign competitors, smaller local competitors and consumers. In the case of the non-Caribbean competitors, he believed that better use of IT as well as being able to obtain better economies of scale provided advantages for these firms.

The CIO identified four strategies that the firm was pursuing to address the current competitive environment. The current IT investment efforts seemed to be directed primarily at one component of this – improving operations by improving productivity and efficiency and reducing costs. To date the firm did not have a practice of formally integrating IT strategy into its business strategy, but the creation of the position of the CIO was expected to do that.

Most of the current IT activity within the firm appears to be decentralized, with all of the businesses making some use of IT. Much of the firm’s current investment seemed to focus on the “food group” businesses. However, it had also introduced a Wide Area Network to facilitate communication and collaboration among its various businesses

4.4.6 Firm E

4.4.6.1 Firm E - Background

Firm E is a banking firm with branches throughout Barbados. It is a subsidiary of a Trinidad-based financial services firm. The sole interviewee was the CEO and he described the business of the firm simply as “to buy money and sell money”.

The CEO reported that he had been with the bank for approximately eight and half years, all of it in the CEO position. The bank had a staff complement of approximately 150 persons. There is an IT Department but at the time of the interview the position of IT Manager was vacant, with the bank expecting to hire a new manager in the near future.

4.4.6.2 Interview 8: Firm E - CEO

In general, the picture painted by this interview was that of a firm recognizing the importance of IT but facing some difficulty in getting the IT implemented and used in the most effective way. Despite the CEO’s apparently strong interest and direct involvement in the firm’s IT implementation, the Internal Context of the firm does not appear very favourable for increased use of IT to improve competitiveness.

In particular, there are no indications that senior management other than the CEO are very supportive of IT initiatives. The organization structure also does not appear to be favourable, in that, while there seems to be some decentralization of responsibility in determining IT needs for each business unit, the IT resources are centralized and there is little indication that the business units have the capability to articulate and champion their needs.

The source of impetus for IT initiatives is also unclear. While the CEO appears to be a driving force, his comments suggested he was more involved in day-to-day management of the IT function than in developing a vision for the role of IT in the organization.

Indications are that the bank’s external environment is becoming increasingly competitive, with the threat from both Caribbean and non-Caribbean sources increasing significantly. The local credit unions are expanding into the traditional markets of the commercial banks while increasingly, global financial management firms were being attracted to the local market. The CEO has recognized the need to respond to these threats, but while acknowledging that IT can assist the bank to become more competitive by becoming more efficient in its operations, he did not identify a clear role for IT as a competitive tool. There were indications that he was also unhappy about being “forced” by the Central Bank to implement certain IT systems as part of its efforts to regulate the local banking system.

The overall process of IT implementation, management and use does not appear

highly focused on deriving competitive benefit from IT. While there is a Computer Steering Committee that provides a forum to address user issues, it appears to be preoccupied with resolving operational problems, although the CEO pointed to changes in that situation. Also, with the temporary absence of an IT Manager, it was not clear how the overall IT function was being managed and supported. The bank had engaged consultants to provide IT services, but it was not clear whether this was the full range of services that would normally be provided by an IT Department.

The discussion did not identify the specific IT applications being used by the bank or the extent of IT use. Also, although there was not much said about specific project failures and difficulties, the CEO appeared very dissatisfied with the way IT was implemented and managed under the previous manager.

4.4.7 Firm F

4.4.7.1 Firm F - Background

Firm F is a small civil and structural engineering consultancy business. The company is wholly-owned by the Director and at the time of the interview, it had been in operation for approximately 18 months. In addition to the Director, the firm had 4 full-time employees. It also engages other engineering professionals on an assignment-by-assignment basis from time to time according to the demands of specific assignments.

4.4.7.2 Interview 9: Firm F – Director

The Internal Context of this firm appears generally favourable for increased IT use although this is negated by the lack of resources identified. The management of the firm in the person of the Director, is highly supportive of the use of IT, and evidently has sufficient competence in IT to identify applications that are potentially useful to firm. While there are indications that the attitudes of staff towards IT use have caused difficulty on some occasions, the attitude is generally positive.

The discussions indicated that the Director had a clear understanding of his competitive environment and how it had changed over the years. He was able to articulate fairly precisely who he considered to be the firm's main competitors and what level of threat they represented. Further while the firm did not have a formally articulated business strategy, there was evidently a carefully thought out plan for developing the competitive position over time.

IT appears to be an important factor in this firm's operation for a number of reasons. Firstly, the Director believed that his firm had derived specific advantages over its competitors through its use of IT, although he expected those benefits to be short-lived. Secondly, he believed the increased use of IT accounted for what he identified as the most significant change in the competition in recent years – the reduced differentiation among competitors.

4.4.8 Firm G

4.4.8.1 Firm G - Background

Firm G is a commercial bank based in St Lucia. It is referred to as an “indigenous” bank, which in the Caribbean, simply means that it is locally owned. The bank was one of the first locally owned banks to be established in the Caribbean, and in the past promoted itself as the bank of choice for the lower socio-economic classes who felt they were not being properly served by the mostly foreign-owned banks.

It is a public company and currently operates at five locations in St Lucia. It only operates in St Lucia. The bank has approximately 75 employees.

An interview was held with the Managing Director (MD), who is the bank’s chief executive. He had been with the bank, and in the position of Managing Director, for approximately 3 years.

4.4.8.2 Interview 10 – Firm G – Managing Director

One of the most striking observations from this interview was the MD’s strong belief in IT as an enabler within the bank. While he did not offer many specifics about the internal structure and operations of the bank, he created the impression that the Internal Context was very favourable towards increased use of IT for competitive purposes. His enthusiasm and strong support for IT suggests that he is a major force in driving IT use within the bank. He also indicated that the rest of management and staff were as supportive of IT, attributing that in part to the relatively young age of the management and staff body.

The MD believes the bank’s environment is becoming increasingly competitive. Although the non-Caribbean competition is a significant factor, he is of the view that Caribbean-based competition is the biggest threat. Non-traditional financial institutions such as credit unions, insurance companies and even government institutions also pose competitive threats.

Considerable importance has been attached to changing the public perception of the bank from its traditional role as a financial institution catering to the lower socio-economic classes within the society. IT appears to play a role in this changing perception, although it is not clear how much impact IT has had in that regard.

The IT function is managed by a technical specialist who also has significant experience in the banking environment. While the MD did not elaborate on the details of how IT is managed within the bank, he expressed confidence in the ability of the technical team to provide the required levels of service. He did not give any indication of the extent to which the technical team was involved in making or influencing high-level decisions about IT use.

IT is used to support the full range of operations, including “front office” (customer service) functions and back-end functions such as accounting. The bank has been able to link the operations of its various branches via a Wide Area Network and also deploy an intranet to support internal communications.

The MD was of the view that IT was critical to the banks success, particularly in terms of improving the efficiency of operations and allowing it to remain competitive. He also believed that the bank’s future survival depended on IT. In general, he expressed an overwhelmingly positive opinion about the role of IT within the bank and the level of actual contribution it had made. Even when asked about negative experiences, he did not offer any examples of areas in which he was dissatisfied. This could signify that the bank has been very successful in implementing and using IT under his leadership. It could also mean that given his strong belief in IT, he has chosen to play down the significance of any negative experiences to date.

4.5 Cross Case Analysis

4.5.1 Cross Case Summary

Table 4-4 presents a comparative summary of the analysis of the interviews, using the dimensions of the analytical framework. For ease of comparison, summaries of the interviews with IT Managers are presented separately from those with non-IT managers.

Table 4-4: Cross Case Summary for Project 1

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
5.1.1 Internal Context			
Resources	Resource availability emerged as a factor in 3 of the 7 interviews. In the small startup Firm F , the firm was not using IT as much as the Director would like because of cash flow constraints. In the much larger Firm D , “constraints of available cash” made it necessary to implement IT investment projects on an industry-by-industry basis within the group, according to the CEO. He did not create the impression that this affected the overall decision to invest in IT – just the timing of the investments. In the case of Firm G however, availability of financial resources appeared to be an enabler, as it allowed the firm to overcome other potential constraints of the availability of resources.	Availability of resources emerged as a factor only in the interview with the IT Manager of Firm D , who believed that sensitivity to cost at the business unit level was an inhibitor to greater IT use.	The fact that availability of resources did not emerge as a more significant factor in the use of IT is somewhat surprising. While this may be partly due to the fact that the interview protocol was not designed to directly address this question, the issues should be explored more directly in subsequent research. Should it emerge that managers of Caribbean firms do not consider availability of resources to be a significant constraint, it would affect the approach to how use of IT is promoted within the firms.
Management attitudes	Firm A: Management supportive and took a lead role. Firm B: Overall management attitude an inhibitor. Age perceived as a factor. Firm C: Generally receptive when clear benefits perceived. Tendency to resist radical change. Firm D: Attitude of senior management “very receptive” but attitude of middle management possibly an inhibitor. CEO strong supporter of IT. Firm E: CEO highly supportive of IT. Not specific about attitude of management team but on balance they do not appear as supportive. Firm F: CEO supportive of IT and is main driver in small firm. Firm G: CEO very supportive of IT. Interested at both a personal and professional level. Reports strong support from rest of management team. Suggests age is a factor.	Firm B: Attitude was generally positive; this represented a change over time. Age considered a factor. Also, management primarily considered IT an operational tool. Firm C: Considered attitude of head office management to be positive, but less so for business unit management, who seemed particularly concerned about cost and implementation issues. In some cases, inhibiting. Firm D: Senior management attitudes positive. CEO attitude in particular – leading by example.	In all cases, attitudes of top management appear to be positive overall. DGM of firm C suggests they are supportive only when within their comfort zone. Several comments, particularly in Firms B, C and D suggest that attitude at operational management level may be an issue. It raises a question of whether middle management attitudes can be a “bottleneck” in IT implementation and use.

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Staff attitudes (non-management)	Firm A: no specific comment. General impression that firm was supportive of IT. Firm C: Attitude of staff “relatively positive”. More resistance to non-computer technology. Firm D: Generally positive. Had adapted to IT “better than expected”. Firm E: “they liked it”. Also liked recent move to graphical user interface (GUI). Firm F: Generally supportive, but in some cases staff felt IT was being “imposed” on them. Firm G: Attitudes were positive. MD considered age a factor in that regard.	Firm B: IT Manager considered staff attitudes to be an inhibiting factor and that staff were not taking advantage of available IT. Firm C: Did not characterize as either enabling or inhibiting, but believed that they were not able to exploit full capabilities of existing IT. Negative attitude towards training exacerbated this.	Although the Director of Firm F pointed to possible resistance because staff felt that IT was being “imposed” on them, the non-IT managers generally characterized the attitudes of staff as positive, making this an enabler overall. The 2 IT managers who commented on staff attitudes did not convey such a positive impression however. In particular, they both felt that the attitudes of staff did not allow them to take full advantage of IT, even in the case where training was being offered.
IT competencies	Firm A: Firm is an IT vendor and its IT competence is a key resource. Firm F: Director’s knowledge of available IT and interest in IT was key driving factor in IT decision-making and investment.	Firm B: User and management competence in IT was a factor affecting IT use.	IT competence did not emerge as a significant factor in most of the interviews, possibly because the question was not directly addressed. However the effect of in-house IT competence identified by discussions with non-IT managers in Firm A and Firm F gives some support to the notion that firms with high levels of IT competence among senior management will be more disposed towards IT investment.

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Organizational structure	<p>Firm A: Regional in nature, and perceives its competitors as firms who can also compete on regional scale. Firm C: Involvement in different types of business and highly decentralized structure lead to significant differences in IT use at individual company level. Each company made its own decisions about IT investment. Firm E: Organizational structure made individual units responsible for articulating their IT needs and use of IT. No indication that they were provided with resources to assist them to do so. IT Manager reported to CEO, but by circumstance, rather than by design. Organizational structure assumed high level of IT skill.</p>	<p>Firm B: IT manager reports to Finance Director. Appears to have very little influence in IT decision-making. Firm C: The highly decentralized nature of decision-making, the differences in business types and the varying ownership structures mitigated against the level of influence that the group-level IT manager could exert on IT decisions at individual company level. Firm D: Individual businesses relatively independent and IT had swung from centralized to decentralized over time. Now moving to “hybrid” arrangement to allow CIO to provide strategic direction for IT.</p>	<p>With the exception of Firm A, in each of the cases where organizational structure emerged as a factor, the structure seemed to inhibit greater IT investment and use as the two seemed misaligned. The IT managers also conveyed the impression that their ability to influence IT decision-making was significantly constrained by the organizational structures and their position within it. This raises the issue of IT management/ organizational structure alignment as one to be further investigated.</p>
Sources of competitive advantage	<p>Firm A: Unique ways of doing business, physical presence in the Caribbean and representation of major brands were key sources. Firm B: “Full infrastructure”, knowledge of customer base and knowledge of local market. Firm D: Knowledge of local market provided advantage over foreign competitors. Better IT provided advantage over local competitors. Firm E: Knowledge of local market provided advantage over non-Caribbean competitors. Also ability to implement own decisions directly provided advantage of multinationals. Firm F: Identified use of IT as a source of competitive advantage, but expected it to be short-lived.</p>	<p>Firm B: Being a wholesaler as opposed to a retailer insulated firm from competitive pressures faced by retailers. Also exclusive relationships with suppliers provided some protection. Firm D: CIO believed firm’s investment in IT gave it competitive advantage over its local competitors, and made it better able to compete with non-Caribbean competitors.</p>	<p>Local knowledge and physical presence emerge as being perceived by non-IT managers as significant sources of competitive advantages. Some managers also believed that IT in itself provided competitive advantage. Given this, an issue to be investigated is whether firms are using IT in a manner that allows them to leverage the perceived advantages.</p>

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Expectations from IT	<p>Firm A: IT would allow the firm to improve customer service, improve efficiency and respond more quickly to competitive situations. Firm B: IT would allow better management of inventory, which was critical to the firm's success. Would also provide better marketing information. Firm D: IT would make firm more competitive by providing information to support better and faster decision-making. Firm F: IT would make firm more efficient and consequently more profitable. Firm G: IT would make the firm more competitive, more efficient and better able to meet customers' needs.</p>	<p>Firm B: Make better information available to support decision-making. Firm D: Make firm more efficient, more productive and better able to compete, particularly against larger international competitors entering the market.</p>	<p>There was generally an expectation that IT would enable firms to become more competitive, particularly by allowing them to operate more efficiently, and by providing better information for decision-making.</p>
Effect of age of staff	<p>Firm B: Older members of senior management were more reluctant to embrace IT. Felt that for this reason, more IT initiatives should come from IT department. Firm E: Younger employees tended to embrace IT, while older ones were "afraid" of IT. Also younger employees accepted changes to existing systems more readily. Firm G: Believed that because the management and staff body was relatively young, there was a higher acceptance of IT.</p>	<p>Firm B: Younger managers were making greater use of available IT and were influencing older managers. Expected that efforts to change attitudes would be more effective with younger staff.</p>	<p>The effect of age was not raised by the interviewer in any of the interviews and only emerged when raised by the respondents. In all cases, they believed that younger persons had more positive attitude towards or made better use of IT. It was noted that both respondents in Firm B felt that management attitudes towards IT in the firm was related to age.</p>
Sources of IT impetus	<p>Firm A: "Top-down driven process" where management develops business strategy and IT strategy derived from that. Firm B: No clear source of IT impetus. Firm E: Many sources – the "demand side". IT department not a significant source of IT impetus, however. Firm G: Senior management team was source of impetus.</p>	<p>Firm B: No clear source of IT impetus identified. Suggested that Marketing function was most influential. Finance also had some influence. IT department was not a source and believed that IT should be "championed from higher up". Firm C: Multiple sources of impetus – mostly individual businesses or IT department.</p>	<p>Different sources of impetus were identified across the different firms when this issue was raised. It was noted that in none of these cases did the IT manager or IT department emerge as a significant source of IT impetus. This raises the question of the role of the IT department and the level of the IT manager, (where there is a separate IT function within the firm).</p>

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
5.1.2 External Context			
Sources of Competition	<p>Firm A: Primarily relatively large non-Caribbean firms offering similar products and services that were able to operate on a regional basis. Non-Caribbean firms without established base in the region had become a threat recently but were not significant. Firm B: Identified four categories of competitors, 3 of these being primarily local. Local competition emerged as the most significant. Firm C: No single category of competitor identified as being most significant, because firm's diverse businesses had different types of competitors. Compared itself to "other Caribbean conglomerates" for benchmarking purposes. Firm D: Did not identify any specific category of competitors, stating that the firm had no "core business" and faced different types of competitors in the different industries in which it operated. Firm E: Main competitors are banks (foreign and local) and credit unions (local). Also some competition from mutual funds and increasingly from international financial firms. Firm F: Primarily local firms offering services similar to that offered by Firm F. Limited foreign competition. Firm G: Any institution offering similar services to the public, including banks, credit unions, insurance companies, even government agencies.</p>	<p>Firm B: Competitors are primarily similar local firms. Foreign competition not a significant factor at present. Firm C: Did not offer general summary of competition, pointing out that nature of competition was different for different businesses. Acknowledged that for automobile and food distribution businesses, foreign competition was significant. Firm D: Did not offer a general summary, pointing out that firm had different competitors in different sectors. However, singled out food distribution and automobile businesses as ones where foreign competition most significant.</p>	<p>While all the business managers interviewed showed a clear understanding of their competitive environment, only one of the 3 IT managers appeared to be able to articulate the nature and characteristics of the competition. This raises the issue of how well IT managers understand the firms external environment (particularly the competition) and whether they could make a better contribution if they have a better understanding. How much effort should firm put into ensuring that IT Managers understand the nature of the competition faced?</p>

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Changes in competition	<p>Firm A: Caribbean market now attracts foreign competitors who would previously not have been interested in that market. Firm B: Increase in number of small importers, increase in retailers taking on importation role; introduction of foreign competitors and increased merger and acquisition activity in the sector. Firm C: Firm faced increased competition from traditional business partners such as suppliers and customers. Increased foreign competition. Singled out automobile business. Firm D: Mergers among competitors have led to fewer larger competitors in local market. Also, more competition from foreign firms. Firm E: Both local and foreign competition intensifying. Credit unions have become more prominent. Some regional competitors have brought new skills to the market. Increased activity from foreign firms. Firm F: Reduced differentiation among local firms, brought about by increased IT use, had changed basis of competition. There had been some increase in foreign competition, but it was not significant. Firm G: Increased competition from non-traditional sources such as insurance companies and government agencies. Foreign competition element had diminished although overall level of competition had increased.</p>	<p>Firm B: Local competitors had become more aggressive. Small traders had become more significant because of larger numbers. Foreign retailers were a new threat because they took market share away from Firm B's competitors. Firm C: Identified 2 specific changes – increase in importation of used cars and increase in direct importation in food distribution business. Firm D: Competition in automobile industry was more intense because of increased importation of foreign used cars. Also, entry of North American retailers into local market.</p>	<p>All respondents believed that competition had become more intense in recent years. With the exception of Firm A respondent, all respondents referred to increases in local competition. All respondents with exception of Firm G believe that foreign competition had increased. Thus nearly all respondents believe both foreign and local competition had increased. On balance, it does not appear that respondents perceived increase in foreign competition more significant than increase in local competition.</p>
Regional and International context influences	<p>Firm A: As public sector market was important for firm, its market was significantly influenced by government policies on IT use. Also, monitored state of economies in markets where it operated.</p>	<p>Firm D: Trend towards “globalization” and “trade liberalization” were perceived as leading to greater interest in local market by foreign competitors. Terrorist attacks of 11 September, 2001 had made firms more reluctant to expand overseas and had slowed entry of foreign competitors.</p>	<p>Issues identified separately in this category emerged in only a few interviews. May suggest that the indirect effects of such issues do not feature prominently in the assessment of the respondents.</p>

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Technology effects	<p>Firm B: Stated that firms selling computers and automobiles were losing sales because consumers were importing directly via the Internet. Firm C: Consumers ordering foreign used cars through the Internet had contributed to a significant reduction in business for the firm's automobile business. Firm E: Current interest in Internet banking made it a potential threat. Bank found it necessary to counter action by others operating locally to implement system to make ATM facilities interchangeable. Firm F: IT had helped reduce the differentiation among firms, forcing them to find new ways to compete.</p>	<p>Firm B: Believed direct effect of IT on competition (e.g. Internet-based selling) to be minimal for his firm. However, better information made available by IT systems helped competitors become more aggressive. Firm D: Use of Internet to import foreign used cars has had significant effect on automobile business.</p>	<p>The most significant effect of technology on the competitive environment identified was the effect of consumers being able to import goods via the Internet, thereby bypassing local firms in favour of foreign competitors. This appeared particularly significant in the automobile trade. However the levelling effect of IT cited by the Firm F respondent is also an interesting development, and one to be investigated further.</p>
Consumer behaviour	<p>Firm B: Move towards online importation via the Internet, had significant impact on computer and used car businesses. Firm C: Increased use of Internet for importation of used cars had significant impact on the firm's automobile dealership. Firm E: Local residents increasingly investing funds abroad, thereby attracting foreign competitors to the local market. Also, consumers were becoming more demanding as they were influenced by what was available elsewhere.</p>	<p>Firm D: Consumers increased use of the Internet for importation of foreign used cars.</p>	<p>The effect of the Internet on consumer behaviour emerged prominently among those addressing this issue. The effect of changing consumer expectations, while raised by only one respondent, may also be an important consideration.</p>
Availability of external support	<p>Firm C: Lack of local availability of specialized applications and support for some of the firm's business operations was a constraint in some cases. Firm G: Lack of availability of local support was a factor but not a constraint, because the firm was willing to procure the services abroad.</p>	<p>Firm C: Firm was able to get external support in the few cases that it was needed.</p>	<p>The availability of local external support or lack thereof, did not emerge as a significant factor affecting IT use. Although it was a consideration in some cases, it appears to be a constraint that can easily be overcome.</p>
Comparison of IT to competitors	<p>Firm C: Firm was on par with local and regional competitors but behind international competitors with regard to IT use. Did not attribute any competitive advantage or disadvantage to this. Firm D: Firm was ahead of local competitors in use of IT. Needed to improve IT levels to be more competitive against international competitors. Firm G: Firm's IT system as good or better than other banks operating locally. Identical system to other local bank.</p>	<p>Firm D: Better IT gave non-Caribbean firms a competitive advantage.</p>	<p>This did not emerge in most of the interviews. It does show however, that some firms actively compare the use of IT to that of their competitors.</p>

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Sources of Competitors' advantage	<p>Firm A: Access to better technology provided an advantage to foreign competitors, although the respondent believed this was diminishing over time. Firm B: Foreign competitors and smaller local competitors derived competitive advantage from making effective use of information generated by the IT systems. Also, some competitors had introduced highly automated order processing systems. Firm E: Larger size and scope of operations were perceived to provide a competitive advantage to foreign competitors. Better access to IT because of resources available globally was also an advantage. Also, ability to offer more sophisticated products to customers. Firm F: Larger non-Caribbean competitors had an advantage on larger projects because of ability to better satisfy requirements for bids, particularly with regard to experience in similar projects.</p>	<p>Firm D: Better IT resources and use of IT were perceived to provide competitive advantage for larger foreign competitors. These competitors also derived advantages from having greater buying power.</p>	<p>Better use of IT emerged as a perceived source of competitive advantage for the larger foreign competitors in a number of interviews.</p>
Government policy and action	<p>Firm A: Firm had benefited from increased government interest in using IT to support public sector reform. Also benefited from governments' interest in forming partnerships with private sector. Recent action by government in one territory to pass legislation to enable e-commerce was also expected to stimulate interest in IT products and services such as those offered by his company. Firm C: Decisions by governments to reduce duties and taxes on computers several years ago had the effect of stimulating IT use. However, lack of automation in government procedures, particularly customs and excise, negates some of the benefits of the firm's use of IT to process relevant documents. Firm E: Central Bank regulations and policies were a key driver of the firm's activities. Respondent believed that certain IT requirements were being forced on his firm by the central bank. Firm G: Central bank policies and actions had some influence on the firm's use of IT but the respondent did not consider it significant.</p>	<p>Firm C: Lack of enabling legislation and environment was seen as constraining the development of e-commerce.</p>	<p>The influence of government policies and actions did not emerge as a significant influence in that regard. However the role of government in creating an enabling environment for the use of IT appears to be a matter that needs to be explored further.</p>

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Public perceptions and expectations	Firm A: Public perceptions and expectations factored into the firm's competitive strategy, but no indication that it affected firm's use of IT. Firm E: It was important that the public perceived the bank to have IT systems comparable to that of the competitors as this affected its competitive position in the market. Firm G: Believed that use of IT affected public perceptions of the firm although he did not indicate that it was a significant factor.		While this is a consideration, it has not emerged as being perceived as important by most respondents.
Other external constraints	Firm C: High telecommunications costs were identified as a factor constraining the use of IT. Was not necessarily a significant factor for the firm, however. Firm D: Lack of skilled persons was identified as a constraint against IT use. This translated into increased training costs. High telecommunications costs were also identified as a constraint. Firm E: Shortage of persons with combination of IT management skills and knowledge of the needs of the banking sector was a constraint to increased IT use in the firm.	Firm C: Nature of relationship with distributors constrained the firm from using the Internet to sell its products directly to consumers. High telecommunications costs also identified as a constraint.	High telecommunications costs and lack of IT skills were the issues emerging here. The importance of these issues may need to be investigated separately.
5.1.3 Process			
How IT developed over time	Firm A: IT had evolved over time. Firm's own use of IT had benefited from its engagement with partners. Firm C: IT had developed incrementally, starting with typical operational applications such as accounting, inventory and billing. Firm E: IT development was driven by technical considerations, particularly limitations of existing systems and need to keep up with business demands. Firm F: The firm began using IT from its inception. No significant change in the way it used IT since it started operating.	Firm B: Moved from a custom-written, batch-oriented inventory and billing application in use for 15 years to an "off-the-shelf" online application. Firm D: IT had moved from a highly centralized to a highly decentralized function over time. It was now moving towards a hybrid of centralization and decentralization.	Among respondents who specifically addressed this issue, only the CIO of firm D created an impression of IT development following strategic direction. Generally, it appeared that the IT evolved or changes were made to accommodate specific technical needs.

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
How IT managed	<p>Firm A: “Internal support group” responsible for providing internal IT services. Separate from persons who provide IT services to clients. Firm C: Each division has a “IT Manager” with the Group IT department. Largest subsidiary companies have in-house IT staff. Firm E: There is a position of IT Manager reporting to the CEO, but it was vacant at the time of the interview. Also a Computer Steering Committee chaired by the CEO which provides a forum for ongoing discussion of technical and non-technical IT issues. Individual business units have responsibility for determining IT needs. Firm F: No separate IT function. Director made IT decisions. Some support functions outsourced. Firm G: Day-to-day management by Operations Manager who had technical support staff.</p>	<p>Firm B: Provision of service on a day-to-day basis the responsibility of IT Manager and one additional staff member. IT manager reports to Finance Director. IT manager appears not to be involved in high-level decision-making and budgeting for IT. Firm C: Group IT department, headed by Group IT Manager, provides IT services to companies in the group. Some larger companies have own IT staff. Staff of Group IT department assigned responsibilities on a divisional basis. Firm D: IT units within individual companies in group have day-to-day responsibility. CIO at “head office” has overall oversight and strategic responsibility.</p>	<p>With the exception of the very small Firm F, all the firms had a separate IT function, with day-to-day technical responsibility for IT. The levels of the IT managers and their influence varied, with the CIO at one end having strategic and oversight responsibility and the IT Manager of Firm B at the other end seeming to have only day-to-day technical responsibility.</p>
How IT deployed	<p>Firm C: Firm used deployment of new IT as opportunity for changing processes.</p>	<p>Firm C: Approach depended on circumstances of each business unit. Head Office IT managed servers and overall infrastructure but beyond that responded to demand from business units. Little centralization/interconnectivity among businesses.</p>	<p>In general, there was very little discussion on the process of deploying IT.</p>

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
IT Role	<p>Firm A: Enabler to allow firm to deliver services as efficiently as possible. Firm B: Support for day-to-day activities such as sales, inventory and billing. Also, development of in-house presentations for customers and suppliers becoming increasingly important. Firm C: Primarily facilitating the day-to-day activities of the company. However, survival of firm depended on it. Also, increasing role in facilitating communication and coordination among units within firm. Firm D: To make firm more efficient and allow it to become more competitive. Firm E: Role was an enabler, to keep the bank's operations efficient. Firm F: To reduce cost and improve "bottom line". Although IT contributed to competitive position at present, respondent did not believe this was sustainable and did not consider part of the IT role. Firm G: Bringing about improvements in operation efficiency. Also allowing bank to be more competitive and survive competitive environment.</p>	<p>Firm B: Provision of better information to support decision-making. Firm C: Presently, primarily an operational support role. Could play a more strategic role if management of business units were willing to invest in IT for that purpose. Firm D: To make the firm more competitive and survive the increasingly competitive environment by improving efficiency, reducing cost of operations and making better information available.</p>	<p>In general, respondents saw IT as playing an important operational role, and in some cases being necessary for the survival of the firm. In particular, the role of IT was mostly seen as helping to improve efficiency and reduce operation costs. This was expected in turn to lead to improved competitiveness. Some respondents saw IT as playing a direct role in improving competitiveness, but one respondent held the view that any such benefits would have been short-lived. One of the questions that emerges from this is the extent to which managers expect IT to contribute directly to competitiveness when considering IT investments.</p>
Competitive responses	<p>Firm A: Restructuring of company and consolidation of its activities to compete more effectively in the Caribbean region. Also ensuring greater technology transfer from partners. Firm B: Re-positioning firm as a "regional player" to take advantage of network of affiliate firms in the Caribbean. Also, "divisionalizing", to achieve narrow focus of smaller competitors. Firm C: Use of IT to become more efficient and more competitive. Firm D: Become more efficient to become more effective. Firm E: Development of new products to provide greater differentiation from other competitors. Firm F: Developing relationships with customers. Improving efficiency through use of IT. Focusing on specific market segments. Firm G: "Staying close to your market" – keeping focused on local market and understanding the external factors that affect the market.</p>	<p>Firm D: CIO identified 4 competitive responses being pursued: Consolidation of present business operations to achieve economies of scale; Improving efficiency and productivity of operations; offering new products and services; partnering and collaborating with new entrants (including potential competitors)</p>	<p>The three main types of strategies emerging from the discussions were (a) increasing scale of operations (b) improving efficiency and reducing cost of operations and (c) increased focus on specific market segments. One issue to investigate therefore is the extent to which IT is being used to support these strategies. While there is some evidence it is being used to support (b) and more limited evidence of it being use to support (a), there is very little evidence it is being used to support (c). There was no indication for example, that any of the firms were planning to use CRM systems. It was also noted that the CIO of Firm D was the only IT manager to comment on the competitive responses again raising the issue of understanding of the external environment.</p>

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Business and IT strategy	Firm A: Firm had a formally articulated business strategy and IT was part of that. Firm B: No indication that firm had formal business or IT strategy. Firm C: Business strategy consisted primarily of financial benchmarks. No IT strategy at Board level, but possibly at IT Department level. Firm D: There was an IT strategy as part of firm's formally articulated competitive strategy. Firm E: Did not have a documented IT strategy. Not clear if it had a documented business strategy. Firm F: Did not have formally articulated business strategy or IT strategy. However, Director was able to clearly articulate firm's competitive strategy. Firm G: Formal business strategy being developed. Not clear whether formal IT strategy included.	Firm B: IT manager did not know whether firm had formally articulated business strategy and did not believe it had IT strategy. Firm C: Stated that firm had a formal IT strategy, but that it was outdated. Firm D: Business strategies were developed at the individual company level. Presently there was not a practice of articulating IT strategies, but this was being addressed.	Formal articulation of business and IT strategies did not appear to be common practices among these firms.
Improving benefits from IT	Firm B: Need to increase awareness of the benefits that could be derived from the firm's existing IT resources. Firm C: Taking opportunity of introduction of IT to "reengineer" processes. Also, becoming more proactive in acquiring and using IT to achieve specific benefits.	Firm B: Felt that training and changing staff attitudes were the means necessary to increase benefits from available IT. Also believed changes should be "pushed from on top". Firm C: Management training to develop a greater appreciation for business benefits of IT. Also budgeting to allow experimentation and evaluation of newer technologies.	Among those addressing this issue, there was strong support for the view that greater awareness of what IT capabilities were available and how they could be used was important if greater benefit was to be derived from IT investment. The comments by the DGM of Firm C also raise the question of whether firms are sufficiently proactive in identifying benefits available from IT, and allowing adjustment of their processes to take advantage of IT.
Staff training	Firm A: Firm committed significant resources to staff training. Firm D: Firm provided training for managers and was able to see "immediate benefits". Also provided training for staff to overcome shortage of skilled staff. Firm E: Training provided when new systems introduced.	Firm C: Firm had training programme in place to provide operational training in using of standard productivity applications. Disappointed with response to training offerings.	Some evidence that in-house training is being offered, although there is little indication that these firms have structured an ongoing training programmes.

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
5.1.4 Content			
IT applications available	<p>Firm A: Almost all functions within the firm automated. Singled out Sales Force Automation system as being particularly important to the firm and the image it wished to present to customers. Firm B: Main application is a system for managing inventory, sales and billing. Also uses presentation software to develop in-house presentations. Firm C: Standard business applications such as accounting, inventory and billing. Lotus Notes being used for communication and collaboration. Firm D: Firm had introduced WAN for “groupwide” use. Also a groupwide financial management system. New integrated application was being introduced to “food group”. Other applications were implemented at the subsidiary company level. Firm E: Used a “frontline” banking application for main operations as well as Microsoft Office products for administrative support. Also used Internet primarily for internal purposes. Reference was made to an “Intranet” but it was not clear if it was functional. Firm F: Uses specialist engineering applications for core activities and various productivity applications for support activities. Firm G: Has IT applications available to support full range of activities. Also has ATMs installed and a WAN in place linking all branches.</p>	<p>Firm B: Main application identified was the inventory, sales and billing application. Firm C: All businesses within the group were “computerized”, with applications varying according to the nature of the business. Lotus Notes was used to provide e-mail and collaboration throughout the group. Firm D: New applications being deployed in “food group” to cover all aspects of the operations. Firm also had an e-commerce application for the food group.</p>	<p>Generally the discussions revealed that the firms had what might be considered “typical” business applications. Most of these were for operational support. Only one respondent (CIO of Firm D) reported the use of an e-commerce application. One of the issues emerging from a review of the applications is whether the firms should make efforts to acquire and use more strategic applications.</p>
Extent of IT Use	<p>Firm A: Almost all of the firm’s operations automated. Also, all staff had direct access to computers for their work. Firm B: Extent of use appears to be low. Both the range of applications available and the number of users relative to the staff of the firm appear low. Firm C: IT use described as “average” but no elaboration provided. Firm G: IT being used extensively – to support full range of activities as well as across the bank’s geographical locations.</p>	<p>Firm B: About 100 of the estimated 240-250 staff had access to computers. This was mostly the “office staff”. Warehouse operations were entirely manual. Firm D: IT used extensively in all the firm’s businesses. Estimated that 30-40 percent of staff are “information workers” who use computers for their work on a day-to-day basis.</p>	<p>With the exception of Firm A, in cases where the numbers of users are identified, it appears to be a low proportion of the workforce. Also, in some firms, only some of the critical processes are automated. One issue emerging is the level of benefit firms could realistically derive from increasing the range of functions to which IT is applied and the number of persons who use IT directly as part of their work.</p>

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Benefits realized from IT	Firm A: Offered few specifics but explained that IT allowed the Firm to prepare bids for government contracts more quickly and easily than would have been possible with a manual system. Firm B: Suggested benefits from inventory management capabilities. Also respondent believed the firm had derived competitive advantage from being able to develop its presentations in-house. Firm C: Increased collaboration and communication among businesses in the group as a result of introduction of Lotus Notes. Also believed that IT had allowed firm to survive increase competition. Firm F: Main benefit cited was reduction in time and manpower to complete certain tasks. Firm G: IT had allowed the bank to remain competitive and to raise its profile. Would not have been possible otherwise.	Firm C: Did not articulate specific benefits derived but stated the expenditure on IT was justified.	The range of benefits explicitly identified does not seem as extensive as the expectations discussed earlier.
Experience with IT to date	Firm C: Acknowledged some unspecified failures but experience was generally positive. Believed the firm had gotten “value for money” from its IT investment. Firm D: Programme of new IT investment was in “embryonic stages” and CEO expected benefits to show in another 12 months. Believed activities were “on track”. Firm E: CEO appeared satisfied with some aspects of the firm’s IT and dissatisfied with others. Overall however, the impression of a difficult IT experience was created and he appeared more dissatisfied than satisfied.	Firm B: Some difficulties experienced in moving to new online application. Partly due to users’ difficulty in understanding different method of operation of new system.	Of the firms identified in this section, only in one case did it appear that there was overall dissatisfaction. Generally, respondents felt the IT experience was positive overall.

Item	Non-IT Managers	IT Managers	Remarks/ Observations/ Issues Emerging
Potential and unrealized benefits	Firm B: Firm was not making effective use of the sales and marketing information available from the system. Also, the order processing process could be further automated. Firm had not taken opportunity to eliminate positions whose sole purpose was data entry and processing. Firm C: Firm had not taken the opportunity of introduction of new IT to reengineer its processes. Firm F: Director believed the firm could get better value from project management application if the application can be configured to better match the way the firm organizes its work.	Firm B: Capability of system to generate sales and marketing information was largely untapped. Also believed firm could benefit significantly from implementing internal e-mail system. Firm C: Lack of awareness of capabilities meant that available systems were underutilized. Particular mention made of use of accumulated data for analysis and prediction.	Much of the unrealised benefit being reported is attributable to lack of awareness of the capabilities of available systems or lack of utilization of these capabilities. This suggests that training and other activities to improve awareness may be required.
IT successes	Firm B: Moving from batch-oriented to online system had resulted in more up-to-date information being available from the system and reduced duplication of work. Firm C: Use of Lotus Notes to increase levels of communication and collaboration within the firm was singled out as a significant success. Firm E: Bank had been successful in introducing a “front end” system in 2000. By contrast, a major international competitor had introduced a similar system and received many customer complaints. Firm G: Ability to offer credit cards. Also ability to maintain real-time access from remote branches and the availability of an Intranet to support internal communications.		Although some successes are identified here, during the interviews, these did not generally “jump out”. It is noted that in Firms E and G the successes identified are based on improved services to the customer while in the case of Firms B and C, they are based on improving internal processes.
IT difficulties	Firm B: The fact that the warehouse was not online meant that there were a number of manual procedures required to keep track of warehouse inventory, resulting in delays. Firm C: Referred to some projects as “money down the drain” but did not provide specifics of difficulties. Firm D: Managers not using available systems appropriately and not taking advantage of available capabilities was cited as a difficulty. Firm E: The effectiveness of IT management within the firm emerged as a significant area of difficulty.	Firm B: Communications difficulties experienced after moving to online application. Significantly affected use of the system. Also, difficulties created by users’ lack of familiarity with the concept of an online system.	During the interviews, respondents were generally reluctant to classify IT use as “difficult” or IT projects as “failures”

Source: Compiled by author

4.5.2 Assessment of Satisfaction

The discussion of the results would benefit from some indication of the apparent “success” of the use of IT in the various firms, as per the views expressed by interviewees. The concept of IS/IT “success” or “effectiveness” is however, one of the most vigorously debated areas of research. Not only is there significant disagreement on how to measure success - there is also significant divergence on the fundamental question of what constitutes success.

DeLone and McLean (2003) propose a causal model for success that uses “Net Benefits” as the overall measure of success. The model is a refinement of that proposed in the highly influential DeLone and McLean (1992) paper, which identified “organizational impacts” as the overall measure of success. In the DeLone and McLean (2003) model, *Information Quality*, *System Quality* and *Service Quality* are identified as affecting *Use* (or *Intention to Use*) and *User Satisfaction*. These in turn affect *Net Benefits*, from the perspective of the “owner” or “sponsor” of the system.

DeLone and McLean (2003) acknowledge the critiques of a number of authors in revising the original model. Among these is the work of Seddon et al (1999), who argue that “different stakeholders in an organization may validly come to different conclusions about the success of the same information system” (p. 4). Seddon et al (1999) propose a two-dimensional matrix with the first dimension representing the system being studied and the second dimension representing the stakeholder in whose interest the system is being evaluated. The authors proposed a 5 x 6 matrix with 5 rows representing five different stakeholder perspectives and 6 columns representing six types of systems.

While the data in this study does not allow for an elaborate assessment of “success” or “effectiveness”, it does allow for a general assessment of respondents’ overall satisfaction with their organizations’ IT use. Such an assessment would correspond closely to the intersection of Row 4 (Owner/ Managers interest group) and Column 4 (all applications used by the organization) of the Seddon et al (1999) matrix. There is also considerable precedent in the IS research literature for the use of “User Satisfaction” as a proxy for success and the DeLone and McLean (1992, 2003) models recognize satisfaction as being a key indicator.

Table 4-5 presents an assessment of the overall level of satisfaction. Where the data shows that a respondent was generally dissatisfied with the way the firm was currently using IT, the level was ranked as “Low”. Conversely, if the data pointed to general satisfaction, the level is ranked as “High”. In cases where there appears to be a fine balance between those aspects with which the respondent was satisfied and those with which he was dissatisfied or the data does not allow an assessment to be made one way or the other, the level was ranked as “Neutral”. The “Remarks” column summarizes the main reasons for the particular assessment.

It can be seen from Table 6 that although most of the respondents expressed some confidence in IT and had high expectations of what IT could do for their firms, only 2 out of the 10 persons interviewed can be deemed to have expressed a high degree of satisfaction. On the other hand, 4 respondents had low levels of satisfaction. It is interesting to note that none of the IT managers were assessed as having “High” satisfaction while there was an even split between IT and non-IT managers among those having “Low” satisfaction.

Table 4-5: Levels of Satisfaction

Firm	Interviewee	Level of Satisfaction	Remarks
A	Manager for Government services	High	Conveyed a very positive impression of the firm’s use of IT. Indicated that the firm was gaining competitive advantage from its current IT. Did not express dissatisfaction with any aspect of the firm’s IT use.
B	Divisional Manager – Sales and Distribution	Low	Made several statements suggesting he did not believe the firm was deriving the benefits it could from its available IT resources. Also believed that partly because of their age, the (older) more senior management were not proactive in either using or seeking ways to gain benefit from IT.
B	IT Manager	Low	Did not believe that users were taking advantage of the available IT. Believed that attitude is a major inhibitor. Also seemed to believe that senior management should play a greater role in promoting the use of IT.
C	Divisional General Manager – Manufacturing and Services division	Neutral	Believed the firm has derived good “value for money” from its IT to date, but for the most part appeared to focus on basic operational tasks. Did not express any major dissatisfaction with IT but did not convey an impression that he believed the firm is doing as well as it can with regard to IT use.
C	Group IT Manager	Low	IT manager seemed dissatisfied with the lack of use of the available systems. Also seemed unable to influence the IT decisions of individual business units to the extent that he would like.

Firm	Interviewee	Level of Satisfaction	Remarks
D	CEO	Neutral	Although the CEO expressed strong confidence in IT, he did not indicate either strong satisfaction or dissatisfaction with what had taken place to date. Some dissatisfaction was expressed with the use of IT by middle management, while there was some satisfaction with the use by lower level staff. In general however, it was a case of waiting to see the effects of the current efforts.
D	CIO	Neutral	The CIO expressed great confidence in IT and had high expectations of IT's future contribution to the firm. He however did not provide sufficient information on experiences to date to allow an assessment to be made of his satisfaction, possibly due to his relatively short tenure with the firm and the fact that IT management arrangements were in transition.
E	CEO	Low	Stated that he believed that he was getting what he could "reasonably expect" from IT but not necessarily what he wanted. The interview revealed several points of dissatisfaction, including the attitude of senior management team and the way IT had been managed and implemented in the past.
F	Owner/Managing Director	Neutral	The Director felt that the firm did not have the level of IT resources he would have liked and alluded to some problems that had occurred in using IT. On the other hand, he believed that the firm had been able to make good use of the IT resources that it had. He had a positive disposition towards IT and indicated willingness to invest in more IT.
G	Managing Director (MD)	High	MD was very supportive of the use of IT and believed that the firm could not survive without it. He seemed to attribute much of the firm's current competitive position to its use of IT.

Source: Compiled by author

4.6 Discussion

4.6.1 Internal Context

Availability of Resources did not emerge as a major factor from the interviews. Interestingly, among the non-IT managers interviewed, financial constraints were identified as a significant factor in 2 cases – by the CEOs of the smallest (Firm F) and the largest (Firm D) firms in the study. In both cases however, they referred explicitly to *cash flow* constraints, suggesting that they viewed these constraints as short-term – there was no indication in those interviews that they were dissatisfied with their investments in IT to date or were reluctant to invest in IT in the long-term. The other respondent who raised the issue was the IT Manager of Firm C who indicated that the individual business unit managers were sensitive to the cost of IT investments.

The fact that availability of financial resources emerged as a constraint for the very small firm F is not surprising. There are indications in some of the literature on IT in small businesses (e.g. Doukidis et al, 1996) that small businesses tend to have fewer resources available to implement IT solutions. It is interesting however, that while the CEO of the largest firm in the survey identified financial constraints as having an impact on the firm's use of IT, most of the others, including all but one of those who were dissatisfied, did not. One possible explanation is that the scale of investment that Firm D is undertaking is such that cash flow has become an issue. In general however, with the exceptions mentioned above, respondents did not seem to think that spending more on IT would improve the satisfaction, implying that other constraints contributed more to their dissatisfaction.

Most respondents considered *Management attitudes* to be supportive of IT, but 3 of the 4 respondents who were assessed as having low satisfaction with their firms' use of IT also gave indications that management attitudes were inhibiting IT use. None of the respondents assessed as having high satisfaction gave such indication, pointing to a relationship between management attitude and the success or extent of use. This is consistent with much of the literature, including the findings of Caldeira and Ward (2002) that have identified the support of top management, and in particular of the CEO, as a determinant of IT adoption and success.

While both of the IT managers who explicitly addressed the issue of *non-management staff attitudes* considered it an inhibitor, none of the non-IT managers did. When the evidence of the attitudes of both management and non-management staff are juxtaposed, another issue emerges – the attitude of “middle” or operational management. Some of the comments, including the explicit statement by the CEO of Firm D and comments by the IT Manager of Firm C raise the possibility that even where the attitudes of senior management and that of non-management staff are supportive, that of operational or “middle” management can be an inhibitor. The CEO of Firm C for example, referred to problems arising from middle management's inability to effectively use information available from existing systems.

Another issue related to attitude is the *effect of age*. Both respondents in Firm B seemed to believe that because of their relatively advanced age, managers were reluctant to use IT. The CEO of Firm G on the other hand, attributed much of the supportive attitude towards IT in his firm to the relatively young age of his management and staff.

The issue of attitude towards IT and its relevance to IT adoption, use and success has been widely discussed in the literature. One of the most recent and comprehensive discussions on this topic is provided by Venkatesh et al (2003), who review the user acceptance literature and discuss eight prominent models, empirically comparing them and their extensions. The authors then formulate a unified model integrating elements from these eight models and empirically test the results. The influence of age is discussed by Venkatesh et al both in relation to models being reviewed and the new model being derived. The authors point out that there is support for the view that age is a factor in determining use, but has been found to be related to gender. Also, one of the findings from the empirical test of the unified model, is support for a hypothesis that the influence of *performance expectancy* (the degree to which an individual believes that using a system will help him or her attain goals in job performance) on behavioral intention will be moderated by gender and age, such that the effect will be stronger for men, and particularly for younger men. This suggests that younger men can be expected to be more disposed towards using IT than other groups. It should be noted however that the respondents who raised the issue of age did not imply a connection between age and gender.

Much of the literature on the effect of attitude tries to explain individual acceptance and use of IT. Thus far, relatively few attempts to empirically relate managers' attitudes towards IT to the decisions to *invest in* IT have been found. One such study was reported by Harrison et al (1997), who concluded that "a small business executive's decisions to adopt an IT to help his/her firm compete is a function of attitude, subjective norm and perceived behavioral control" (p. 189). According to the authors, *attitudes* are "a function of the positive and negative consequences executives see", *subjective norms* "flow from stakeholder positions inside and outside the firm regarding the IT adoption decision" and *perceived behavioral control* "reflects anticipated resources and barriers to adopting new IT, as well as executives' beliefs about overcoming them".

IT competencies did not emerge as a significant factor in this study, although it was identified as a determinant factor by Caldeira and Ward (2002). However, the Firm A respondent identified this as a key resource, which was not surprising, given that provision of IT services is the firm's main business. In the case of Firm F, where the Director was the main driving force, his knowledge of what IT was available did significantly influence the firm's use of IT, while he also believed that his limited ability to use some of the products affected the attitudes of the staff towards these products.

Organizational structure was explicitly discussed in 5 of the 10 interviews. With one exception, the impression created by these discussions was that the organizational

structure was inhibiting greater use of IT. In particular, two of the interviews with IT Managers revealed that ability to influence the direction of IT investment and use in their respective organizations was constrained by the structure. The discussion with the CEO of Firm E, a commercial bank, indicated that while individual business units were responsible for defining their IT needs, the specialist technical skills that would enable them to do so were not available.

Caldeira and Ward (2002) conclude that the position of the IS/IT Manager was not a significant factor emerging from the analysis. The analysis in this study on the other hand, suggests that it may be significant. Further support for this view comes from the absence of evidence that the persons interviewed considered their respective IT departments or IT managers (where they existed), as a significant source of *IT impetus*. It remains to be investigated, whether the real issue is the position or, as Caldeira and Ward (2002) suggest, the influence of the IT Manager within the firm. It should also be noted that the two respondents who were assessed as having a high level of satisfaction were unequivocal about top management being a source of IT impetus. By contrast, those assessed as having low satisfaction were more ambiguous on this point.

Of 5 non-IT managers who identified their firm's perceived *sources of competitive advantage*, 4 identified local knowledge or a physical presence in the local market as one of them. Some respondents also believed that IT in itself could provide competitive advantage, either through more efficient performance of certain operations or by providing better information to support decision-making. Although the managers identified better local knowledge as one of the sources of competitive advantage, they did not identify the ability to provide better information to support that local knowledge as one of their expectations.

4.6.2 External Context

In discussing the *sources of competition*, respondents in all the firms identified both Caribbean and non-Caribbean competition as being significant. With the exception of Firm A however, none of the respondents indicated that non-Caribbean competition was more significant than Caribbean competition, while 2 firms explicitly identified Caribbean-based competition as being more significant. As far as *changes in competition* are concerned, all respondents believed that competition had become more intense in recent years. With the exception of Firm A, all firms experienced increases in local (Caribbean-based) competition while all firms except Firm G were experiencing increases in non-Caribbean competition.

When respondents' perceptions of the nature of competition and the changes in the competitive environment are analysed against Porter's "Five Forces" model (1979, 1980), only two of these emerge as prominent considerations. The "threat of new entrants" and "jockeying for position among current competitors" are the main forces that respondents alluded to. There was very little indication that the effect of increasing power of buyers or suppliers or the threat of substitutes were considered

major issues, although it can be argued that the effect of Internet commerce, which is discussed elsewhere in this analysis, is due to an increase in the power of consumers.

While the above observations are consistent with the assertion in Chapter 2 that Caribbean firms are facing an increasingly competitive environment, it does not appear that the firms necessarily perceive their competition in “local versus foreign” (or “Caribbean versus non-Caribbean”) terms. It also, cannot be concluded that changes in foreign competition were perceived to represent a greater threat than changes in local competition.

Some of the context issues described by Avgerou (2001) appeared to have only limited influence on the perceptions of the respondents. *Regional and International context influences* were only explicitly identified in two of the interviews. In the Firm A interview, it appeared to have a direct effect because it affected the market and demand for the firm’s services. However, in the instance of Firm D, there was only the perceived indirect effect on the willingness and ability of foreign firms to enter the local market. *Government policy and action* was somewhat more influential. However, in the cases where it was most influential - firms A and E, this was specific to the nature of the business in which they were involved. Other comments pointed to the effect of government policy and action on what is referred to in the ICT for Development literature (e.g. UNDP, 2001) as the “enabling environment”.

Technology effects and changes in *consumer behavior* had affected the competitive environment for several of the firms in the study. The main commonality between the two was the effect of the Internet, which facilitated consumers who wished to do business directly with foreign exporters and foreign exporters who wished to enter the local markets without either a physical presence or a local partner. The effect of this was very noticeable in the automotive trade, in which two of the participating firms were involved. It had become possible for consumers to import used cars directly and this had led to a significant decrease in business for new car dealers, forcing them to re-evaluate their business models.

Another interesting effect of increased IT use was that reported by the Director of Firm F – it eliminated the competitive advantage of some firms as IT allowed smaller or less capable firms to produce output of similar quality to that of their competitors.

Among those respondents who commented on the *sources of competitors’ advantage*, better access to IT or more effective use of IT was considered important. Advantages of scale were also identified. Interestingly, one respondent believed that some smaller competitors had an advantage because they were able to make better use of IT.

While *comparison of IT to competitors* did not emerge as a significant consideration for most firms, there is evidence that some firms actively compare their use of IT to that of their competitors. The respondents that commented on this point all believed that their firms were on par or better than their local competitors with regard to IT use, while two of them believed that they were at a disadvantage with regard to foreign competitors. This is consistent with the earlier observation that some firms

considered better use of IT to be a source of competitive advantage for their foreign competitors.

Respondents from firms C and G alluded to lack of local availability of certain specialized software or skills as being a consideration in some cases. Also, in discussing *other external constraints*, firm D and E respondents identified lack of persons with appropriate skills as a constraint. Despite this however, *availability of external support* did not emerge as significant factor overall, as it appeared that the lack of availability locally could be easily overcome by sourcing from elsewhere. Availability of external support also did not emerge as an enabler.

Public perception and expectations appeared to be important for Firm E, although it did not emerge as a significant factor otherwise.

4.6.3 Process

The CIO of Firm D was the only interviewee who gave the impression that the *development of IT over time* had followed a particular strategic direction. In that case, the firm had decided to move from a decentralized IT management arrangement towards a partly centralized arrangement to provide strategic focus. Where other respondents addressed this topic, it appeared that IT evolved over time, driven by technical or operational considerations.

With the exception of the very small Firm F, all the firms in this study had separate IT functions, with the position of the IT manager ranging from that of CIO with strategic and policy oversight responsibility in Firm D, to that of the IT Manager in Firm B who appeared to have only day-to-day technical responsibility. The arrangements for *how IT was managed* were not necessarily aligned with the organizational structure however. In fact, in all the cases where level of satisfaction was assessed as “Low”, there is evidence of lack of alignment. In Firm B, where both respondents were assessed as having low satisfaction, the IT Manager seemed to have little influence in IT decision-making and did not emerge as a source of IT impetus. In Firm C, where the IT Manager seemed to have little influence over the IT decisions at the individual business unit level and the role of the Group IT Department appeared to be largely one of support. In Firm E, there was currently no IT manager and it appeared that the CEO was dissatisfied with the previous manager. The CEO also indicated that individual business units were responsible for identifying their IT needs. It did not appear however, that these units had the capability to undertake this responsibility and no assistance was being provided to them in this regard.

The importance of IT management arrangements, particularly the role of the “IT organization” – the body of individuals within the firm providing IT resources and services to the rest of the business (after Peppard, 2001) – and its relationship to the rest of the organization, has been explored from different perspectives in various empirical studies and conceptual discussions (e.g. Blanton et al, 1992; Rockart et al 1996; Peppard, 2001). There is consensus that an IT management structure that is consistent with the organization structure and is able to support its strategic objectives

is necessary for IS effectiveness. The lack of alignment has therefore emerged as one of the difficulties facing some of the firms.

Most respondents described the *role of IT* in terms of the contribution it was expected to make to operational efficiency. Thus there was the expectation that IT would support day-to-day activities and reduce costs. One respondent – the CIO of firm D, identified the production of better information as part of the role. The general indication is that the role of IT is perceived as being primarily operational, as opposed to strategic.

Three broad competitive strategies emerged from the discussions of *competitive responses* that respondents perceived as necessary to respond to the changing competitive environment. These were (a) increasing scale of operations (b) improving efficiency and reducing cost of operations and (c) increased focus on specific market segments. The role of IT as described by respondents however, seemed to be focused primarily on (b) - improving operational efficiency.

Only the respondents from firms A and D indicated that IT featured in formally articulated business strategies. For most firms, there did not appear to be an established practice of developing formal *IT strategies*.

There was some awareness of the need to *improve the benefits currently being derived from IT* in several of the organizations, although it was not clear how this would be undertaken. There was very little discussion on the organization and execution of *staff training* programmes and in the case where it was discussed (IT Manager of Firm C), it did not appear to have had much of an impact on IT use.

There was no substantial discussion on the actual *deployment of IT*, except with the respondents of Firm C. This did not emerge as a significant factor.

4.6.4 Content

The discussions on *IT applications available* showed that most firms had IT applications that provided support for their core business functions. For the most part, these applications appeared to be primarily for operational support purposes, although there were signs that some firms were moving towards applications that went beyond operational support, leading to changes in business processes. An example is the case of firm C, where the business manager interviewed believed that a “groupware” product introduced a few years before had a significant impact on the level and quality of intra-firm competition.

With regard to the *extent of IT use*, the firms in this study had computerized most of their core operational functions, although the extent of computerization varied significantly. Firm A appeared to have the most extensive computerization, with “almost everything” being automated. A review of the extent of the nature of applications and extent of use reported by respondents supports the view that the in most cases, IT has not been deployed in a manner or to an extent that supports the

competitive strategies that are required to respond to changes in the competitive environment. It is also noted that several respondents believed that the use of IT was not relevant to the work of a significant proportion of their work force.

The respondents who discussed the issue of *benefits derived from IT* all believed that their firms had derived significant benefits from its IT use. In the case of firms C and G, the non-IT managers interviewed believed the use of IT had allowed their firms to survive the increasingly competitive market. There was also acknowledgement of the fact that several of the *potential benefits* had not been realized, partly because the firms had not made complementary organizational changes that would allow them to derive these benefits.

As has been highlighted in the individual interview summaries and subsequent analysis, the firms have had differing levels of success and satisfaction with their use of IT. Despite the fact that 4 respondents were assessed as having a low level of satisfaction with their firms' use of IT, the overall conclusion with regard to the *experience with IT to date*, is that only the firm E respondent gave the impression of grave dissatisfaction. The related questions on *IT success* and *IT difficulties* did not elicit significant data. Although some respondents made occasional references to various difficulties encountered, they seemed reluctant to discuss these in any depth.

4.6.5 Questions raised in executing the research

The research questions stated in Chapter 1 are:

1. How are private sector Caribbean firms using Information Technology (IT) to assist in surviving the increasingly competitive business climate?
2. What are the firm-specific factors limiting the contribution that IT can make to the competitiveness of the firms?

This study was designed primarily to address question 1 and identify key issues to be addressed in order to answer question 2. Section 4.2 identified some specific questions that this initial research attempted to answer. These were:

- (a) What are the perceptions of the competitive environment among the respondents? Is it consistent with the arguments laid out, particularly with regard to the increasing importance of foreign competition?
- (b) Do respondents see IT as playing a significant role in establishing or maintaining their competitive position?
- (c) To what extent (according to respondents' accounts) are the firms using IT in a manner that directly addresses the competitive threats?
- (d) What is the general situation with regard to the IT use within the firms, as respondents perceive it?

- (e) What are the attitudes of management and non-management towards IT?
- (f) What are the key areas and questions that need to be investigated further in order to address the core research questions?

Based on the foregoing discussions, the following responses have been derived for the context in which the research was carried out:

- (a) ***What are the perceptions of the competitive environment among the respondents? Is it consistent with the arguments laid out, particularly with regard to the increasing importance of foreign competition?***

All respondents believed that competition had become more intense in recent years and most believed that competition from both within and outside the Caribbean had increased. Some respondents made direct reference to changes in the global economic environment, including the effects of technology and trends such as “globalization”, which made competition from outside the region a greater threat.

While some respondents identified competitive responses designed to address the threat of non-Caribbean competition, there was not strong evidence however, that the firms treated the Caribbean and non-Caribbean threats as distinct issues when assessing the competitive environment.

Thus while the findings are consistent with the argument that foreign competition as a factor is becoming increasingly important, it cannot be concluded that these firms see it as becoming more important *relative* to local competition. This raises a question about how the issue of competition should be framed in future research. While it may still be useful to analyse the differences in the nature of and responses to Caribbean versus non-Caribbean competition, seeking to have respondents make a clear distinction between the two may not be the best approach.

- (b) ***Do respondents see IT as playing a significant role in establishing or maintaining their competitive position?***

In general, respondents considered use of IT to be critical to the functioning of their firms. All respondents considered IT to be an *operating necessity*, and as such, they saw IT as having a significant role in maintaining the competitive positions of their respective businesses.

As discussed in the response to question (c) below however, despite the respondents’ belief that IT was important to their competitiveness, they were not necessarily using IT in a manner designed to achieve this. In fact, only in 2 of the 7 firms did respondents explicitly identify IT as providing competitive advantage.

(c) ***To what extent (according to respondents' accounts) are the firms using IT in a manner that directly addresses the competitive threats?***

In a trivial sense, it may be argued that any benefits that IT brings to the firm (e.g. reduction in operating costs, reduction in time required to perform certain activities, etc.) will help increase competitiveness. The issue being addressed by this question however, is whether IT is being used in a *strategic* manner to respond to the firms' competitive threats.

The question of what constitutes strategic use of IT and whether or not IT provides competitive advantage has been widely debated in the literature. Wiseman (1994), who claims to have coined the term "SIS", refers to Strategic Information Systems as "the use of information technology to support or shape the competitive strategy of the firm, its plan for gaining, maintaining, or reducing the edge of a rival", or in sectors other than profit-making, "the use of information technology to support or shape the policies or strategies of the enterprise". Thus the extent to which IT can be considered strategic within a particular organizational context depends on the extent to which it assists the organization in achieving or maintaining a competitive position.

Ward and Peppard (2002) identify four main types of strategic systems, "based on research and case studies spanning 20 years". These are:

1. those that share information via technology-based systems with customers/consumers and/or suppliers and change the nature of the relationship
2. those that produce more effective integration of the use of information in the organization's value-adding process
3. those that enable the organization to develop, produce, market and deliver new or enhanced products or services based on information;
4. those that provide executive management with information to support the development and implementation of strategy (in particular, where relevant external and internal information are integrated into analysis).

Although the IT capabilities identified by some respondents (such as the CEO of Firm G) suggest that their firms may have the capability to use IT strategically, in general, the discussions did not indicate that they were. Analysis of the interviews identified 3 main competitive strategies that interviewees believed would allow them to respond to the perceived changes in the competitive environment. These are: (a) increasing scale of operations (b) improving efficiency and reducing cost of operations and (c) increased focus on specific market segments. Also, several of the respondents believed that one of the ways to counter the threat of foreign competitors in their local markets was to leverage their better knowledge of the local markets

A review of the use of IT reported by respondents points to a focus on (b) – becoming more cost effective by improving efficiency of operations. Thus while several of the firms were using IT to “support the competitive strategy” to some extent, there was very little evidence that they were using IT to “shape” the strategy. The uses of IT described also do not correspond closely with the categories of “strategic” systems addressed by Ward and Peppard (2002). Further, although one respondent claimed that his firm developed its IT strategy to support its business strategy, there was generally little evidence of strategic IT planning, or of deliberate efforts to align IT Strategy with Business Strategy.

Proponents of the Resource Based View (RBV) of competitive advantage have been very influential in the debate on how competitive advantage can be derived from IT. These proponents, including Mata et al (1995), Bharadwaj (2000) and Santhanam and Hartono (2003) argue that IT can only deliver *sustained* competitive advantage if combined with specific organizational capabilities, such that these benefits become difficult to replicate. Again, the respondents in this study have given little indication that the firms are using IT in a way that leverages the specific capabilities and advantages that their firms possess. (It should be noted that Carr (2003) offers an even more extreme view on the issue of deriving competitive benefit from IT. He argues in essence, that IT has become so “commoditized”, and so much like “infrastructure” such as transportation and utilities, that it is almost impossible for a firm to derive competitive advantage from IT investment).

From the above, the conclusion that follows is that the firms are using IT to provide operational support and thus to *indirectly* address competitive threats. However they are not using IT in a manner that directly addresses the competitive threats that they have identified.

(d) *What is the general situation with regard to the IT use within the firms, as respondents perceive it?*

This question primarily addresses issues of Content – particularly with regard to IT applications used and the extent of use. As noted earlier, all of the firms in this study use IT to some extent for critical day-to-day functions, although the interviews pointed to differing levels of satisfaction.

The 2 respondents who were assessed to have a high level of satisfaction indicated that their firms used IT extensively, covering most aspects of the firms’ operations, with a high level of integration. In the firms of the respondents who had low satisfaction levels, IT use seemed to be directed at core operations, but did not reflect high levels of integration.

In the discussion on possible analytical approaches in Section 4.3.3.1, it was noted that while “Stages of Growth Models” hold considerable appeal for both descriptive and predictive purposes, empirical research into their validity produced contradictory and inconclusive results. Nonetheless, the associated concept of *maturity* is still relevant to the analysis.

(e) What are the attitudes of management and non-management towards IT?

In most of the firms, the senior management was reported to be supportive of IT and appreciated its value to the firm. There were more mixed opinions about the attitude of the general staff body towards IT, but on balance, they too were considered to have a positive attitude towards IT, although they often only made use of the basic operational capabilities. The attitude of the mid-level (operational) management on the other hand, appears to be a cause for concern. In some cases the attitude of this category, or their slowness in adopting and adapting to IT, was a potential “bottleneck” in getting higher levels of IT use within the firm.

Some respondents also expressed the view that age had some bearing on the attitude towards IT, with younger managers or employees being more supportive or receptive.

(f) What are the key areas and questions that need to be investigated further in order to address the core research questions?

Research Question (2) asks: “What are the firm-specific factors limiting the contribution that IT can make to the competitiveness of firms? The research reported in this chapter primarily addresses Research Question 1.

The research confirms that while the firms involved are supportive of using IT to improve their competitiveness, there are *inhibitors* that are limiting the benefit they are able to obtain. The analytical framework developed in this project will therefore form a basis for a subsequent investigation of those inhibitors.

4.7 Conclusions

This research has used a number of interviews with senior business managers in selected Caribbean firms to illuminate certain perceptions about the use of IT with particular reference to its role in helping the firms address new competitive pressures. In some firms, there was also an opportunity to obtain the perceptions of the IT technical managers in this regard. In addition to determining the perceptions of respondents with regard to IT use, the study also sought to establish whether characteristics of the competitive environment derived from *a priori* analysis were consistent with the perceptions of the managers.

The research was intended to be largely exploratory – it sought to identify the key issues to be investigated in order to determine how IT is being used by Caribbean firms to address the perceived changes in the competitive environment and what different approaches can be used by managers to derive greater benefit. The analysis used a combination of existing theory along with an inductive data-driven approach to identify key factors pertinent to the issues under investigation.

The analytical framework used in the research was derived from a well-established framework for the analysis of strategic change (Pettigrew, 1989; Pettigrew and Whipp, 1991) that had been further extended by empirical research into IS/IT success factors (Caldeira, 1998; Caldeira and Ward, 2002). The framework allows identification and analysis of the relationship between the internal characteristics of a firm (Internal Context), its external environment (External Context), the way it acquires and uses IT (Process) and the actual IT that it uses (Content).

The study reported in this chapter has offered one of the first opportunities to empirically investigate IT use in Caribbean firms. While it is intended to be exploratory, it does offer some useful insights into some of the issues facing Caribbean firms as they try to gain more value from IT. These insights are potentially useful to practitioners, albeit with the caveat that they need to be subjected to further investigation.

The research has also shown that a number of conclusions drawn about IT management and IT success are applicable in the Caribbean environment. It has however identified some less reported issues, such as the importance of the attitude of operational management, that require further investigation.

In addition to the actual conclusions derived from the research, the analytical framework developed during this study provides the basis for both data collection and analysis in subsequent studies. It is therefore anticipated that with further revision informed by additional empirical analysis and subsequent consolidation, this framework may serve as part of an overall approach to both descriptive and prescriptive studies on the use of IT to improve business competitiveness.

4.8 Chapter Summary

This chapter reported on initial exploratory research to identify how Caribbean firms perceived the competitive environment, and how they were using IT to respond to perceived changes in the competitive environment. The project primarily addresses the first of the two research questions.

The research reported in the next Chapter uses Project 1 as a basis for an in-depth investigation into inhibitors to IT use in a Caribbean firm, in order to answer Research Question 2.

CHAPTER 5: IDENTIFICATION AND ANALYSIS OF INHIBITORS

5.1 Chapter Introduction

This chapter reports on the results of in depth research undertaken to identify factors that inhibit the contribution that IT can make to a firm's competitiveness. The research is based on three case studies conducted within a single firm in St Lucia, in the Caribbean.

Section 5.2 provides the background and rationale for the study. Section 5.3 discusses the methodology used for the study. Section 5.4 explains the derivation of the analytical framework that was used to guide the data collection and analysis in this study. Section 5.5 provides background information on the target firm for the study, and shows how the business units meet the theoretical criteria defined in Chapter 3. Section 5.6 – 5.8 present the case reports for each of the case studies while section 5.9 present the cross-case analysis. Section 5.10 summarises the conclusions and findings of the case studies reported in the chapter.

5.2 Background

The results of Project 1 show that the firms in the study were all using IT to some extent, to support key functions. The analysis also showed that even among respondents who appeared dissatisfied with their firm's use of IT, there was still the belief that the IT was critical to the business and that the firms could derive increased benefit from more or better use of IT.

The respondents in the study acknowledged that the business environment was becoming more competitive for their firms and believed that IT could play a role in helping them to respond to the increased competition. However, the role articulated for IT often did not correspond to the strategies identified as being necessary to respond to the perceived competitive threats.

The overall objective of this research has been to identify how Caribbean firms are using IT and to identify what is limiting the contribution that IT is making to improving their competitiveness. The findings of Project 1 support two of the main premises used to justify this research, namely:

- (a) Caribbean firms are facing an increasingly competitive environment. As discussed in Chapter 2, changes in the international economic environment, "globalization" and the erosion of protectionist barriers to competition have forced Caribbean businesses to face competitive pressures they did not previously face.
- (b) There is a high level of confidence in the potential of IT and consequently a continued willingness to invest in the greater use of IT.

In order to determine what improvements in IT management and use will bring about improved benefits, it is necessary to look more closely at what the target firms are

achieving presently and what factors are limiting these achievements. The results of Project 1 provide a starting point and basis for the further investigation proposed. The following however, identifies some additional issues that have been factored into the research design and execution.

5.2.1 Characteristics of Competitive Environment

The results of Project 1 showed that while respondents considered both local and foreign competition to be increasing, they did not necessarily consider foreign competition to be a greater threat than local competition. Further, the evidence did not show that managers in these firms consciously devised different strategies for responding to local versus foreign competition. Therefore, in the second phase of the research, I approached the issue of competition in a holistic way, while leaving open the possibility that more detailed investigation will reveal differences in strategies.

5.2.2 Influence of Internal vs External Factors on IT use and effectiveness

With the exception of the perception of the competitive environment, factors external to the firms in Project 1 did not emerge as having a significant influence on IT investment and use within the firms. Therefore, the research will focus on Internal Factors within the firms.

The decision to focus on factors internal to the firm is consistent with arguments that support the *Resource Based View* (RBV) (Barney, 1991). RBV arguments lead us to expect that the internal characteristics of the firm play a determining role in their ability to derive sustained competitive advantage from IT.

In this study, the RBV is used as the theoretical basis for developing a conceptual and analytical framework in Section 5-4. The relevance of the RBV arguments to the research is also discussed in in section 2.7 in Chapter 2.

5.2.3 Characteristics of Management and Organization Structure

The earlier results also lead us to expect that the characteristics of management of the target firm will be an important factor determining the role, use and success of IT. These characteristics include the organizational structure, the influence of the IT manager and the attitudes of operational management towards IT.

The design of Project 2 takes into consideration the views of both IT and non-IT management. However, greater prominence was given to the views of the non-IT management as they were the ones responsible for developing and executing the strategies necessary to allow the businesses to attain or sustain competitive advantage. Also, the views of both the senior and operational (business unit) management were factored in.

5.2.4 Role of “Inhibitors”

With the exception of one firm in Project 1 (“Firm F”), the firms in the study did not attribute their dissatisfaction with IT to inability to afford the IT resources they deemed necessary. In the case of Firm F, which was a very small engineering services firm, the Director explained that the firm would have liked to make greater use of IT but was constrained by its inability to purchase additional equipment and software. While the Firm “D” managers interviewed indicated that the firm had decided to implement IT on an “industry-by-industry” basis within its business units because of cash flow constraints, there was no indication that the firm would not implement the IT that it deemed beneficial.

The results of Project 1 showed that even among respondents who were dissatisfied with their firm’s use of IT, there was still the belief that the IT was critical to the business and that the firms could derive increased benefit from more or better use of IT. The above implies that for the firms in the study, there were factors other than the unavailability of funds to purchase IT resources, that were preventing them from deriving the expected benefits of IT.

5.2.5. “Contribution” of IT to Competitiveness

In Project 1, even in cases where firms were generally dissatisfied with their IT, they were able to identify specific ways that IT contributed to their competitiveness. In Project 2, the concept of the *contribution* will be used as a means of identifying the benefits derived from IT. While this study does not aim to measure IS success, the “IS effectiveness” stream of research provides a theoretical basis for using the concept of “contribution” in this context. This is explained below.

Many authors have debated the issue of success, and the causes and effects of IS success (e.g. Feld and Stoddard, 2004; Poon and Wagner, 2001; Sanchez et al, 2004). Of particular significance is the work of DeLone and McLean (1992, 2003), Seddon (1997) and Seddon et al (1999). The work of these authors provide an extensive review of approximately two decades of empirical research into IS success (100 articles from 1981-1987 in DeLone and McLean, 1992; 186 articles from 1988 – 1996 in Seddon et al, 1999; “more than 100” articles from 1993-2002 in DeLone and McLean, 2003). These authors have also subjected each other’s work to critical evaluation. Further, the work of these authors, particularly DeLone and McLean (1992), is widely cited in the literature on IS success.

Seddon (1997) critiqued the DeLone and McLean (1992) IS Success model, which contains 6 interrelated dimensions of success, and offered a “respecified” model. Among Seddon’s main criticisms was that the DeLone and McLean (1992) model attempted to combine both process and variance components, and was thus confusing. DeLone and McLean (2003), in reviewing contributions to the IS success literature since the original model, acknowledged Seddon’s (1997) criticisms but argued that to

separate the model into process and variance components as proposed by Seddon (1997) would make it less parsimonious.

Despite the debate among the authors, there are 2 relevant conclusions for which there is consensus among their arguments:

- (a) *That IS success is a multidimensional concept with different component measures contributing to overall success.* Both DeLone and McLean (2003) and Seddon (1997) refer to the concept of “net benefits” as the ultimate measure of the “success” of an Information System. For DeLone and McLean, “net benefits” represents the aggregate value of all the “impacts” of the Information System being evaluated, while Seddon (1997) defines “net benefits” as "an idealized comprehensive measure of the sum of all past and expected future benefits, less all past and expected future costs, attributed to the use of an information technology application." (p. 246)
- (b) *That the determination of success is dependent on the perspective of the evaluator and the nature of the system being evaluated.* DeLone and McLean (2003) for example, state that

“Different actors, players or stakeholders may have different opinions as to what constitutes a benefit to them. Thus it is impossible to define these "net benefits" without first defining the context or frame of reference. The fact that the D & M Model does not define context is a matter of detail, not oversight” (p. 22).

Seddon (1997) identifies 4 principal types of stakeholders from whose perspective success can be evaluated.

Thus by applying the logic of “net benefits” and “impacts” as explained above, it can be deduced that the effect of IT on the competitive position of the firm will be the aggregation of the individual contributions, in much the same way the “net benefits” is the aggregation of the “impacts”.

Secondly, given the importance of the perspective from which the benefits are being determined, in this study, the contributions will be identified from the perspective of the business managers of the firm.

The above are also factored into the analytical framework derived in section 4.

5.3 Methodology

5.3.1 Research Philosophy and Strategy

The overall methodology and strategy applied to the research reported in this Chapter are detailed in Chapter 3. The sections below highlight the specific aspects that are relevant and provide additional details where these are not covered in Chapter 3.

5.3.2 Selection of Cases

The research was conducted as a multi-case study, based on 3 cases within a single firm. The selection of the cases according to the criteria specified in Section 3.3.5 is discussed in detail in Section 5.5

5.3.3 Sources of Data and Data Collection

The case studies used interviews as the primary source of data. This was augmented by documentary evidence and participant observation data, which was used for triangulation, as explained in Section 3.4.1. The sources of data and data collection methods are further discussed in Section 5.5.5.

5.3.4 Level and Unit of Analysis

The level of analysis for the case studies is the *business unit* being studied. The business unit was also the unit of analysis.

5.3.5 Data analysis

5.3.5.1 Overview

The overall process used for data analysis is illustrated in Figure 3-3 and discussed in Chapter 3 - Section 3.5, with a step-by-step illustration of the process in Section 3.5.3. As described in Section 3.5, the data from interview transcripts, observation notes and documents were loaded into Nvivo. The analytical framework described in Section 5.4 below was operationalized as a “Tree Node” structure in Nvivo. A process informed by the *Grounded Theory* approach (Strauss and Corbin, 1998) was used to review each of the data sources in detail and to identify the inhibitors, as discussed in Section 3.5.3. The following are some additional features of the analysis used for the cases in this report.

5.3.5.2 Cause and Effect Analysis of Inhibitors

Project 2 identified a number of inhibitors for each of the business units studied. Project 3 further investigated the inhibitors identified in Project 2 to identify their underlying causes, and the relationships between them, as explained in Section 3.3.3. The detailed analysis of inhibitors in Project 3 showed that each of the inhibitors identified could be a contributing factor to other inhibitors, and could themselves be caused by other inhibitors. Further, underlying contributing factors identified from the Project 3 analysis in some cases contributed to other previously identified inhibitors, or to other contributing factors. In order to simplify the relationships and to ensure that the results derived are parsimonious, we will refer to the factors involved in the cause and effect relationships discussed in this chapter, as *inhibiting factors*. Thus the following constitute inhibiting factors:

- (a) Inhibitors identified from the initial analysis, as shown in Sections 5.6.4, 5.7.4 and 5.8.4
- (b) Factors identified in the data as contributing to the occurrence of the inhibitors
- (c) Effects identified in the data as being caused by (a) or (b) above

The cause-and-effect relationships among inhibiting factors were identified from analysis of the data in Nvivo, as illustrated in Section 3.5.3. For each case, each relationship identified among pairs of inhibiting factors is described in a table presented for that case (Tables 5-13, 5-20 and 5-27 for the Drugstore, Home Store and ABCGI cases respectively). A “relationship type” called “contributes to” was defined in Nvivo to represent the causality.

As can be seen from these tables, each inhibiting factor can be involved in one or more pairs of relationships, as either a cause or effect. For each case, a complete list of the inhibiting factors identified is also presented. These are shown in Table 5-14, 5-21 and 5-28.

5.3.5.3 Derivation of Causal Networks

For each of the cases, the relationships identified among the inhibiting factors are also illustrated as a *causal network*, generated from the data relationships identified in Nvivo (Figures 5-4, 5-6 and 5-8). Miles and Huberman, (1994) describe a causal network as “a display of the most important independent and dependent variables in a field study (shown in boxes) and of the relationships among them (shown by arrows)” (p. 153). The causal network, as described by Miles and Huberman, is conceptually similar to the *relations diagram* tool used for root cause analysis in the Quality Management domain (Dogett, 2005; Mizuno, 1988, Tague, 1995). It also bears some similarities to the Collective Causal Maps proposed by Scarvada et al (2006).

In the causal networks presented in this study, circles (as opposed to “boxes” as suggested by Miles and Huberman), are used to represent the Nvivo nodes involved in the relationship, as the circle is the Nvivo default representation. The cause-effect relationships (“contributes to”) are represented by arrows connecting the nodes. For each row of the relationships table (Tables 5-13, 5-20, 5-27), an arrow is drawn from the cause node to the effect node. Note that in the causal maps shown, only the nodes and the connections between them are meaningful. Graphical features such as the size of the nodes, the weight of the arrows and the proximity of the nodes to each other on the map are only relevant to the aesthetic presentation, and not to the meaning.

5.3.5.4 Count of Relationships

An additional technique for root cause analysis suggested by Dogett (2005) and Tague (1995), is the preparation of a list of all the factors in the causal network (in this case, all the *inhibiting factors*) and to generate a count of the “To” and “From” connections, as well as the total number of connections, for each factor. The number of connections coming “To” a factor represents the number of times it is identified as an effect, while

the number of connectors going “From” a factor identifies the number of times it is a cause.

Tague (1995) makes the following additional points:

- Factors with the highest connection counts are likely to be significant
- Factors with zero “To” connections are root causes
- Factor with zero “From” connections are net effects

Tague also points out however that the number of connections should only be used as an indicator and not as an absolute rule. The list of inhibiting factors presented in Tables 5-14, 5-21 and 5-28 also include a connection count as suggested above.

5.3.5.5 Illustrations used for Case Analysis

For each of cases reports presented below, the following 4 illustrations are used to present the case analysis and results. These are summarized below.

- (a) A model, based on the analytical framework described in Section 5.4 below, that shows the framework populated with the summarized list of inhibitors presented in the narrative. (Figures 5-3, 5-5, 5-7)
- (b) A table showing a list of the cause and effect relationships derived from the data analysis (5-13, 5-20, 5-27)
- (c) A causal network showing the cause and effect relationships derived from the data analysis. The causal network is a graphical representation, generated from Nvivo, of the relationships shown in the table described in (b) above (Figures 5-4, 5-6, 5-8)
- (d) A listing of all the inhibiting factors identified and used in the relationships. These were represented by shortened “node names” in Nvivo to improve the appearance of the causal network. For each inhibiting factor, its corresponding node name is show. The table also shows a count of the “To” and “From” connections as described in section 5.3.5.4. (Tables 5-14, 5-21, 5-28)

5.4 Analytical Framework

This section describes the derivation of the analytical framework for the research. This framework was outlined in the overview of the data analysis process in Section 3.5.1.

5.4.1 Theoretical basis of Analytical Framework

In Chapter 2, the Resource Based View (RBV) was identified as providing a suitable theoretical basis for the research. It was also shown however, that within the existing

literature, there were variations in the constructs used in RBV-related IS research, and the way in which “resources” had been defined. Thus in order to use the RBV as a theoretical basis to drive empirical research, it is necessary to determine what interpretation of the RBV is best suited to the task.

The model proposed by Melville et al (2004) provides a suitable starting point for building the framework required for this study. While not empirically tested like some of the others identified in Chapter 2, the Melville et al (2004) model is based on extensive review of both the conceptual and empirical literature related to “IT value” in general, and the RBV in particular. The classification of resources proposed in this model is relatively broad compared to some of the other models, but is also pragmatic. This decision is also consistent with the argument advanced by Wade and Hulland (2004), who in discussing “resource specificity” – how broadly or narrowly a resource should be defined, state that:

“As a general rule, we recommend that researchers err on the side of generalizability. Narrow definitions of IS resources may suffer from reduced relevance as technologies, systems, and skills become obsolete over time”. (p. 129).

Further, the Melville et al model is one of the few that explicitly attempts to account for the external environment, which they represent as the “competitive environment” domain and the “macro environment” domain. This latter inclusion is relevant to this research as it introduces the possibility of incorporating the peculiar characteristics of the environment in which firms in the Caribbean operate.

Melville et al illustrate the model as shown in Fig 5-1 below. The model posits that IT Resources combined with Complementary Organizational Resources can enable or improve Business Processes. That will in turn lead to improvements in Business Process Performance and ultimately, Organizational Performance.

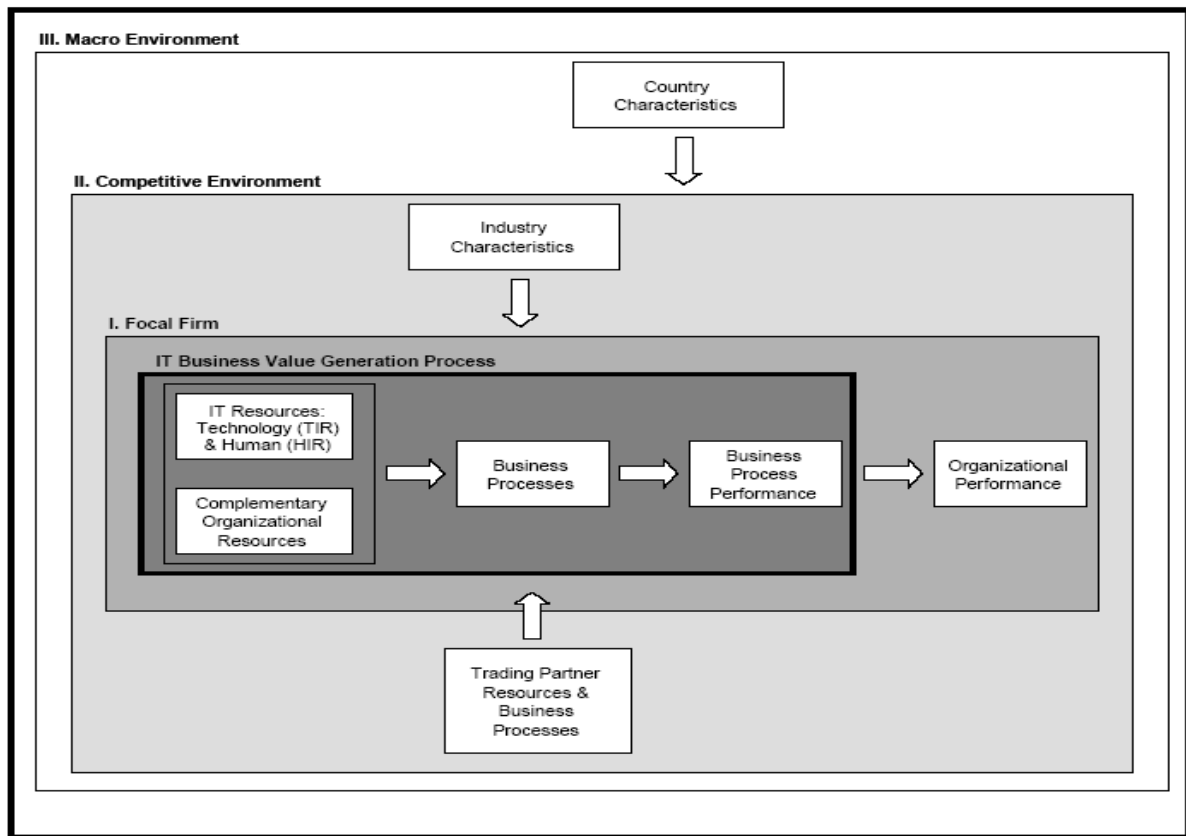


Figure 5-1. IT Business Value Model (Source: Melville et al (2004) p. 293)

5.4.2 Adapting the model

5.4.2.1 Defining Resources

The first task is to select the definition of “resources” to be used in the study. Table 5-1 shows a list of definitions used in the RBV literature. For the purposes of this research, the definition of resources used by Wade and Hulland (2004) will be used. This definition has the advantage of being sufficiently precise to operationalize during analysis of the data, while being broad enough to allow a degree of generalizability.

Table 5-1 Definitions of Resources used in RBV literature

Authors	Definition and Remarks
Amit and Schoemaker (1993)	Resources defined as “stocks of factors owned or controlled by the firm” (p. 35) Distinction made between resources and capabilities. Capabilities defined as “a firm’s capacity to deploy resources, usually in combination with organizational processes that are firm-specific and are developed over time through complex interaction among the firm’s resources”

Authors	Definition and Remarks
Barney (1991)	<p>Resources defined as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive and implement strategies that improve its efficiency and effectiveness" (p. 101)</p> <p>Associates "resources" with the concepts of "strengths" of a firm as used in environmental models of strategic management.</p>
Grant (1991)	<p>States that "resources are inputs into the production process-they are the basic units of analysis. The individual resources of the firm include items of capital equipment, skills of individual employees, patents, brand names, finance, and so on." (p. 119)</p>
Peppard and Ward (2004)	<p>Resources defined as "stocks of available factors that are owned or controlled by the firm" (p. 175)</p> <p>Based on definition of Amit and Schoemaker (1993).</p>
Piccoli and Ives (2004)	<p>Resources defined "to encompass both assets and capabilities. Assets represent anything tangible and intangible the firm can use in its processes for creating, producing, and/or offering its products (goods or services) to a market. Capabilities represent "repeatable patterns of actions in the use of assets to create, produce, and/or offer products to a market" (p 752)</p> <p>Based explicitly on the definition provided by Wade and Hulland (2004)</p>
Ravichandran and Lertwongsatien, (2005)	<p>Resources are stocks of available factors of production owned or controlled by a firm. Capabilities, in contrast, refer to a firm's capacity to deploy resources using organizational processes. Capabilities can be viewed as the capacity of a team of resources to perform some task or activity, and are often developed in functional and subfunctional areas by combining physical, human, and technological resources. (p. 240)</p> <p>Definition of resources based on Amit and Schoemaker (1993) and Capabilities on Grant (1991).</p>
Ray et al (2004)	<p>'Resources' and 'capabilities' are used interchangeably and refer to the tangible and intangible assets firms use to develop and implement their strategies. (p. 24)</p>
Ray et al (2005)	<p>The label resource is used in the general sense to refer indistinctly to all of these concepts. The term capability is defined as a special type of resource, encompassing a firm's capacity to coordinate and deploy other resources to effect a desired end (p. 627)</p> <p>Based on the definitions of Amit and Schoemaker (1993), Grant (1991) and Makadok (2001b)</p>
Rivard et al (2006)	<p>"Resources include assets, capabilities, processes, attributes, knowledge and know-how that are possessed by a firm, and that can be used to formulate and implement competitive strategies". (p. 32)</p>

Authors	Definition and Remarks
Wade and Hulland (2004)	Resources defined as “assets and capabilities that are available and useful in detecting and responding to market opportunities or threats. “ Assets are defined as anything tangible or intangible the firm can use in its processes for creating, producing, and/or offering its products (goods or services) to a market, whereas capabilities are repeatable patterns of actions in the use of assets to create, produce, and/or offer products to a market (p. 109)

Source: Compiled by author

5.4.2.2 Simplification of constructs

While the Melville et al (2004) model provides a suitable starting point, some adaptation is needed to derive a framework that is suited to the specific objectives of the research. Firstly, the research being reported in this document was conducted solely within the firm, and while interviewees were questioned about their perceptions of the competitive environment, no detailed investigation of the external environment (corresponding to domains II and III in the model) was undertaken. Therefore the initial analysis will consider only the *focal firm* domain.

Secondly it is necessary to determine outcome variable. Melville et al use “Organizational Performance” improvements which they state are “aggregate IT-enabled performance impacts across all firm activities” (p. 296). The authors recognize however, that there are a range of financial and non-financial indicators that may be used for organizational impacts. The selection of the outcome variable is discussed in Section 5.4.2.3 below.

Thirdly, this study does not explicitly investigate individual business processes within the business units being studied. Rather, the study investigates the impact of IT at the business unit level. Therefore, the “Business Process” and “Business Process Performance” constructs will be excluded from the analytical model, as their inclusion would unnecessarily complicate it.

5.4.2.3 Identification of outcome variable

The outcome variable identified in the Melville et al (2004) model in Figure 3 is “Organizational Performance”. This study however, is focused on the contribution of IT to competitiveness of firms.

In Section 5.2.5, it was argued, using a comparison to the “IS success” literature as a theoretical basis, that the effect of IT on the competitive position of a firm can be represented by the aggregate of the individual *contributions* of IT to competitive advantage. *Contributions* will therefore be used as the outcome variable in this model.

5.4.2.4 Effect of Inhibitors

The role of *inhibitors* was discussed in section 5.2.4, where it was explained that inhibitors reduced the ability of IT to make the desired contribution to competitiveness. Therefore, in the analytical model, inhibitors will be represented as factors that reduce the potential contribution that can be made by the IT resources. This is shown in Figure 4 below.

5.4.2.5 “Core” IT Applications Used

Within a modern firm, almost any aspect of its operation can be supported by IT. The wide range of activities that can be supported by IT include the customer service and revenue generation functions, accounting, human resource management and even security and building maintenance. It would therefore not be a useful endeavour to try to analyze all aspects of the IT of the firm.

The term “*core application*” is frequently used in the IT practitioner literature to represent the IT application that is used to support the main service delivery or revenue generation functions of the business (e.g. .Burt, 2004; Kendler,2005; Rosencrance, 2004). For each of the business units in this study, the analysis of IT will be based on the core application for the business. The core applications for each of the units in the study are shown in Table 5-5 in Section 5.5.4

5.4.3 Summary of Concepts in Analytical Framework

The summary of concepts is shown in Table 3-2 in Chapter 3. The model is also illustrated in Figure3-4 in Chapter 3. For ease of reference, these are repeated below as Table 5-2 and Figure 5-2 respectively.

Table 5-2: Summary of Concepts for Model

Concept	Description
Resources	Assets and capabilities that are available and useful in detecting and responding to market opportunities or threats. Assets represent anything tangible and intangible the firm can use in its processes for creating, producing, and/or offering its products (goods or services) to a market. Capabilities represent “repeatable patterns of actions in the use of assets to create, produce, and/or offer products to a market. (After Wade and Hulland, 2004).Resources are subdivided into Technical IT Resources, Human IT Resources and Complementary Organizational Resources.
Technical IT Resource (TIR)	All physical IT resources, including hardware, software and infrastructure. Also includes the data maintained by the IT systems as well as reports, analyses, documents or other outputs produced by the IT systems.

Concept	Description
Human IT Resource (HIR)	IT skills, including the technical skills of IT staff, as well as the IT skills of non-technical staff that are relevant to the effective use of available IT systems.
Complementary Organizational Resources	Other firm assets and capabilities including business processes that provide synergies with IT resources.
Inhibitors	Factors that reduce the firm's ability to derive the potential benefits from the available IT resources
Contributions	Benefits attributable to the firm's use of IT, that contribute to the firm achieving a competitive position
Core IT application	IT application used to support the main service delivery or revenue generation functions of the business.

Source: compiled by author

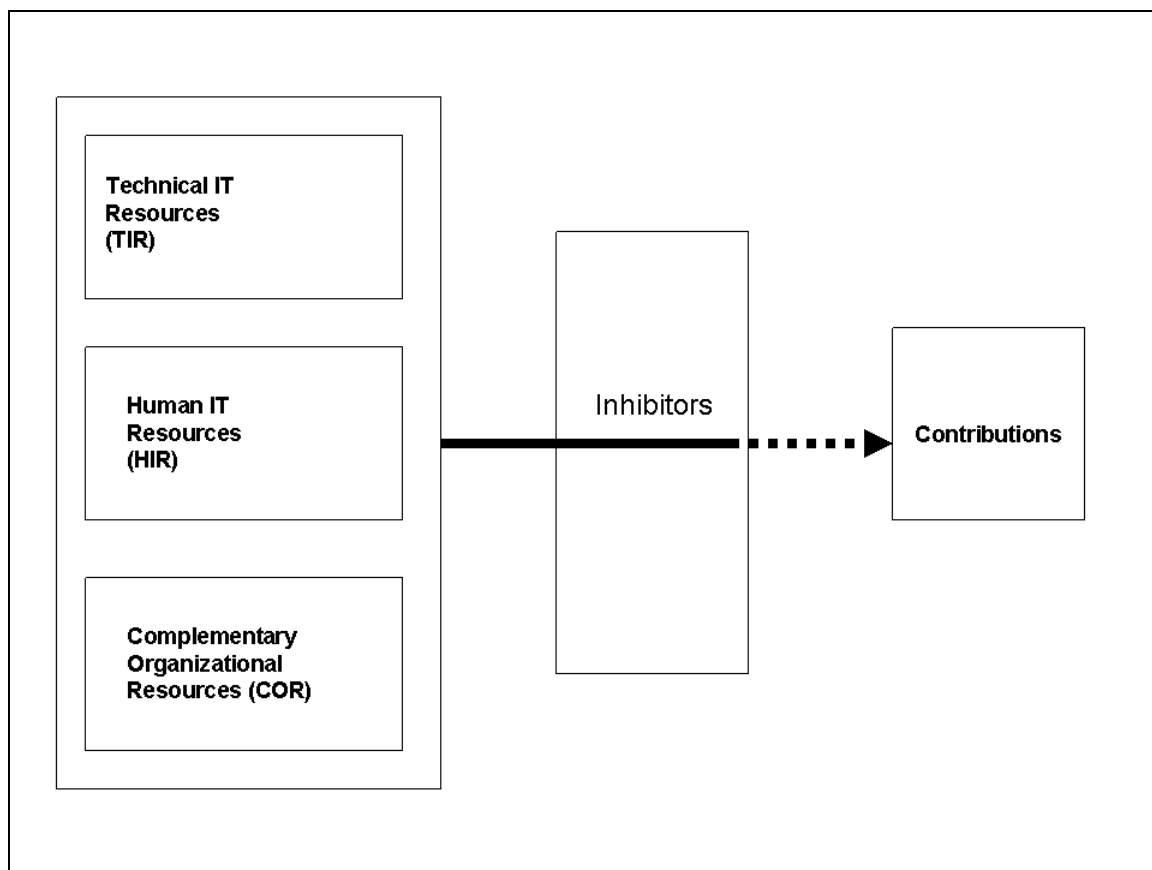


Fig 5-2: Research model (Source: Compiled by author. Adapted from Melville et al, 2004)

In Figure 5-2, the combination of TIR, HIR, COR leads to “Contributions” to a firm’s competitiveness. However the full potential contribution is not realized due to the presence of inhibitors.

5.5 Target Firm and Cases

5.5.1 Background

The firm selected for this research is referred to in this document as the *ABC Group of Companies*. It is a St Lucian enterprise that operates several types of business. Some of these operate as departments of the parent company while some are either wholly-owned or majority-controlled subsidiaries. The main lines of business are as follows:

- Retail – Drugstore
- Retail – Hardware and Building materials
- Retail - Liquor
- Retail/Distribution – Sale of petroleum-based products (automotive lubricants, etc.)
- Retail of computers and office equipment and supplies
- Import and Distribution (wide range of products including food and beverages, pharmaceuticals and hardware items)
- Insurance Company
- Insurance Brokerage
- Light manufacturing (Solar Water Heaters)
- Shipping Agents

With the exception of the manufacturing and shipping businesses identified above, all of the firm's businesses operate in the "Wholesale and Retail Trade" and "Financial Intermediation" sectors identified in the theoretical criteria in Chapter 3. Of these, the businesses in the "Wholesale and Retail Trade" sector (which the company refers to as its "trading" businesses), account for most of the activity and revenue. Most of the wholesale and retail operations are carried out under three main business units:

ABC Distributors is primarily engaged in the import and wholesaling of a wide range of products including food, liquor, tobacco, pharmaceuticals, household items, stationery and office equipment. It mainly acts as the manufacturers' representative and is the sole local distributor for several well-known brands. *ABC Distributors* also operates 4 small retail outlets, although the management considers this to be a minor part of the business. *ABC Home Store* imports and sells building materials, hardware and household items. *ABC Drugstore* imports and sells pharmaceuticals and other convenience items.

In the Insurance market, ABC operates two businesses: *ABC General Insurance* is an insurance company that underwrites typical general insurance coverage including automobile, homeowners and commercial. *ABC Insurance Brokers* on the other hand, places business with other insurers (including ABC General), on behalf of customers. *ABC Insurance Brokers* has offices in two other islands in the eastern Caribbean and is the only business unit in the ABC Group that had operations outside of St Lucia at the time the research was conducted.

In addition to the above, the ABC Group provides certain central services through its Head Office. These include overall financial management, Human Resource Management, Marketing and IT. Note that while IT management and support are centralized, the IT systems are not.

The company uses IT in all of its business operations. However the extent of use and the experience of use vary from business to business. The most extensive users of IT are ABC Drugstore, ABC Home Store, ABC Distributors and ABC General Insurance.

The group's parent company, ABC Limited, has been in existence for well over 100 years. It is a privately held company with the vast majority of shares held by two families, who are descendants of the original founders. The company's Human Resource (HR) Department reported in May 2006 that it had a total staff complement of approximately 450 persons.

5.5.2 Suitability of target firm

Section 3.5 in Chapter 3 identified the criteria to be used in selecting target firms for the research. ABC and the business units selected fully met those criteria, as shown below.

- **Performance.** While the firm's financial data has never been made public, there was evidence that suggested that the firm and the specific business units selected for the study were performing well. Initial indications included observations of continued development and expansion of the businesses, payment of annual bonuses to staff (announced on internal notice board in December 2004), continued expansion of staff complement and increased levels of remuneration to line staff (as per agreement with the employee's trade union) and continued investment in more sophisticated IT. Table 5-4 below shows the number of employees in the 3 business units studied, according to information provided by the HR Department at 2 May, 2006. Table 5-29 in Section 5.9 shows the number of employees in these units, according to data provided by the HR Department as at 8 August 2007. According that data, there were staff increases in all 3 units during the intervening period. In the case of Drugstore the increase was over 50% and in the case of Home Store, over of 30%. Analysis of the length of service of the employees (Table 5-30) also supports this conclusion, as it shows that the number of employees with less than 1 year of service approximately corresponds to the increase in staffing.

The initial indications that company (and the business units reviewed) were performing well and were in strong competitive positions were subsequently confirmed by data from interviews with ABC's senior executives. For example, the Chief Executive Officer (CEO) stated the following with regard to the Home Store business unit:

“With Home Store, I think we are in a strong position ... I don't believe anybody on the island is sufficiently strong to challenge us, our biggest challenge is ourselves... because we are the dominant player I think we have the advantage”

- **Financial strength.** The initial indications that the firm was financially strong were also confirmed during interviews with senior executives. Further, the interviews confirmed that the firm was willing and able to invest in IT once it considered those investments justified. The Group Financial Director (GFD) stated during an interview:

“I would say that there is no financial constraint investing in IT and I would go so far as to say that in a number of our investments it is my personal view that the payback of those have been one year, that is in the software and hardware cost, that is not too much in the manpower time, but in hardware and software costs, wherever we put the new systems the pay back has been one year. So, there are no financial constraints.”

The CEO also stated:

“I would say from a financial perspective, obviously, we can invest in IT because of the size of the Company and we are able to invest not just on the technology but on the people side of the business. We can have an IT department, so that is definitely a plus”

- **Significant role for IT.** The firm makes significant use of IT and has a relatively complex IT infrastructure. It also has a separate IT function in the form of the IT Department which includes an IT Manager and 4 technical staff. The operations of all the three business units studied in this document are all heavily dependent on IT, and as such the functioning of these units would be significantly hampered if the IT systems failed.
- **Longevity and credibility.** The firm has been in operation for over 100 years according to the data on its website and in its Company Profile. This longevity, along with the observations about current performance and financial strength, support a *prima facie* argument that the firm has been able to achieve sustainable competitive advantage. It also suggests that the firm has competent management and leadership, capable of devising and executing sound strategies. This in turn enhances the credibility of information provided and views expressed by the firm's managers. In discussing what he considered to be the reasons for the longevity of the firm and its good performance, the GFD stated:

“We have been in existence for a long time, our shareholders have been very responsible in not draining the profits from the company, we are well poised for further investment, cash is not an issue, we don't suffer the cash flow problems that our competitors come up against. This is one of the areas, the other area is that the family as

well has been very stable, very focused on the growth of the business and their vision has been equivalent to the vision of the professionals and that has obviously led to stability”

In addition to meeting the criteria outlined in Section 3.3.5, the firm also had the advantage of being involved in multiple types of business, introducing the possibility of comparing findings across different types of business.

5.5.3 Business Units Reviewed

As stated earlier, the most extensive users of IT within the ABC Group are ABC Drugstore, ABC Home Store, ABC Distributors and ABC General Insurance. For the purpose of this study the ABC Home Store, ABC Drugstore and ABC General Insurance business units were selected for review. For simplicity, the business units will be referred to as “Home Store”, “Drugstore” and “Insurance” in this document.

In addition to meeting the criteria stipulated in Section 3.3.5, these three units had all made significant investments in new IT systems within a 5-year period prior to the commencement of the research. ABC Distributors on the other hand, was still using an IT system that had been installed approximately 10 years earlier. At the time of the research, the management of ABC Distributors had indicated the intention to review their existing IT systems with a view to replacing or upgrading them.

The more recent investment in the 3 units selected made them more suitable than ABC Distributors on the “Significant Role for IT” criterion described in Section 3.3.5. Further, whereas the business unit managers of Drugstore, Home Store and Insurance were already employed with the firm at the time the respective IT systems were deployed, the current business unit managers of ABC Distributors were not with the firm at the time that ABC’s current system was deployed. Therefore, it was expected that the managers of the units selected would be in a better position to discuss the impact of introducing the respective IT systems.

According to data provided by the Chief Executive Officer (CEO), the approximate contribution to total Group revenue for each of these selected units (as at the end of the 2005 financial year) is as shown in Table 5-3 below. The approximate percentage of IT-related expenditure budgeted for the current financial year for each of the units is also shown in Table 4. (Note that this represents each unit’s IT expenditure as a percentage of its total expenditure for the respective business unit).

Table 5-3: Contribution of Business Units to Revenue and Expenditure on IT

Business Unit	Contribution to Group revenue (%)	IT as % of Total expenditure
Drugstore	9.6	4.2
Home Store	22.5	3.8
Insurance	5.1	16.0

Source: Compiled by author from data provided by CEO of ABC Group of Companies

Table 5-4 shows a comparison of the number of computer “access points” to the number of employees in each of these units. The ratio represents the number of employees per access point. This is based on information provided by the IT Department and the Human Resource Department, in May 2006. For the purpose of this exercise, and *access point* can be defined as any computer workstation, terminal or portable computing device provided by the company to allow employees direct access to the company’s information systems.

Table 5-4: Number of Employees and “access points”

Business Unit	No of employees	No of “access points”	Ratio
Drugstore	79	33	2.4
Home Store	134	66	2.0
Insurance	15	12	1.25

Source: Compiled from data provided by IT Department and HR Department ABC Group of Companies as at 2 May 2006.–

5.5.4 “IT” Reviewed during study

This study focused on the core business application used by each of the business units. As explained in Section 5.4.2.5, the “core application” is the IT application used to support the main service delivery or revenue generation functions of the business unit. In each of the units there was one core application that accounted most of the IT resources and IT-related activities within the Unit. This was confirmed by the IT Manager who stated:

“The way we can classify the growth of the ABC computing environment is that most of the systems tended to develop around systems that provided support for key operational areas, so key operational type systems - systems that supported the cashier activities, systems for distribution and so on, so main business activity that the company was at the time involved in, systems were introduced to support these operations.”

These applications are shown in Table 5-5.

The decision to focus on the core application in each business makes it easier to relate the IT to the performance of the unit since (a) the purpose of the application was to directly support the core business activities and (b) for the most part, the use of the application was directly under the control of business unit Management.

Table 5-5: Core applications used by the Business Units

Business Unit	Core Application
Drugstore	INVENSYS - Integrated retail and inventory management system. Key functionality includes Retail checkout (including barcode scanning), Credit management (Accounts Receivable), Sales Analysis and Reporting, Purchasing, Receiving, Inter-store Transfers, Inventory Management, Multi-store integration

Business Unit	Core Application
Home Store	INVENSYS SQL - Integrated retail and inventory management system. Key functionality includes Retail checkout (include barcode scanning), Credit management (Accounts Receivable), Sales Analysis and Reporting, Purchasing, Receiving, Inter-store Transfers, Inventory Management, Multi-store integration
Insurance	INSURSYS - Underwriting system. Key functionality include Quote generation, Underwriting Management (including capturing relevant details of customers and all policies issued), Generation of Policy documentation, Claims Processing, Reinsurance Processing

Source: Compiled by author

The application used by the Drugstore and Home Store are from the same vendor, but are different software packages. They provide the same core functionality. The main difference between the two applications is in the technical platform, with the Home Store application being based on a more robust database platform and allowing more user and technical configuration options. One of the advantages of the Home Store application over the one used by Drugstore is that while Drugstore can only consolidate and synchronize data among stores on a daily basis (nightly) using a process called “polling”, Home Store is able to do this throughout the day at 15 minute intervals, by using database replication.

Home Store and Insurance had changed their core information systems during the 12 months preceding the interviews. Drugstore had changed its core system approximately 3 years before the interviews.

Several of the business units within the ABC Group use the same accounting package. All 3 units reviewed in this study use that accounting package, which we will refer to as “ACCSYS”

5.5.5 Data Collection

During the study, formal interviews were conducted with the managers who had the most direct responsibility for decision-making with regard to IT investment and use, at both the Group (corporate) level and the business unit level. This was supplemented by additional formal interviews with 6 lower level managers and supervisors and an interview with the ABC Group Human Resource Department Manager, making a total of 16 persons formally interviewed. This is shown in Table 5-6 below. The research also included collection of documentary evidence and collection of data through a participant observation method, as described in Section 3.4.2.2.

Interviews were conducted at two levels:

- *“Business Unit” Level.* Formal interviews were conducted with the two most senior managers within each business unit. The decision to interview these two managers within each unit was based on the existence of an informal ABC Group policy (as explained by the HR Manager) of ensuring that within each business

unit, there were 2 managers who have knowledge of all aspect of the operations of that unit. This ensures continuity in operations. While these managers were the primary sources of information, a total of 5 other lower level managers who had functional responsibilities within those units were interviewed. These interviews allowed me to obtain further elaboration or clarification of specific issues raised by the more senior managers, and also assisted in the data triangulation process

- “Corporate“Level. Formal interviews were conducted with the three most senior managers at the ”Corporate” (or Group) level who were directly involved in IT decision-making at both the Head Office and business unit levels. These were the Chief Executive Officer (CEO), the Group Financial Director (GFD), and the Group IT Manager. The CEO and GFD are both members of the ABC Group’s Board of Directors. An interview was also conducted with the HR Manager to obtain additional information and clarification on issues regarding staffing and staff performance that arose during the research. Additionally, a formal interview was held with the IT Officer who had responsibility for Home Store, to clarify some issues that emerged from the discussions with Home Store management.

Table 5-6: List of managers interviewed.(numbers of interviews in brackets)

Business Unit or Level	Primary Interviewees	Secondary Interviewees
ABC Drugstore	<ul style="list-style-type: none"> • Director responsible for Drugstore (2) • Operations Manager (2) 	<ul style="list-style-type: none"> • Purchasing Manager (1) • Inventory Controller (1)
ABC General Insurance	<ul style="list-style-type: none"> • General Manager (2) • Assistant Manager (2) 	<ul style="list-style-type: none"> • Accountant (1) • Underwriting Supervisor (1)
ABC Home Store	<ul style="list-style-type: none"> • General Manager (2) • Operations Manager (2) 	<ul style="list-style-type: none"> • Sales Manager (1)
Corporate Level	<ul style="list-style-type: none"> • Chief Executive Officer (CEO) (2) • Group Financial Director (GFD) (1) • Group IT Manager (1) 	<ul style="list-style-type: none"> • HR Manager (1) • IT Support Officer – Home Store (1)
Total number of formal interviews - 23		

Source: Compiled by author

5.6 Case 1 – ABC Drugstore

5.6.1 Case Overview

5.6.1.1 Background

ABC Drugstore operates a total of 5 retail stores at strategic locations throughout St Lucia. The main store is located in the capital Castries, in the building housing the ABC Group's head office, while one of the branch stores is located in a shopping plaza just outside Castries. The other 3 branch stores are located in each of the other main towns on the island. In addition to dispensing prescription medications, the Drugstore retails a wide range of products including non-prescription medications, toiletries, cosmetics, confectionery, stationery, household items, pet care items and a variety of gift items.

Overall management of the Drugstore chain is the responsibility of a Director, who is also a member of the Board of Directors of the ABC Group of Companies. Day-to-day management is the responsibility of the Operations Manager (OM), who is responsible for a management team that includes the Chief Pharmacist, Inventory Controller, Warehouse Manager, Buyer and 5 Store Managers – one at each of the locations.

The core IT system that is the focus of this research is the integrated retail and inventory management system being used by all of the branches and departments of the Drugstore, as shown in Table 5-5 above. This is the core application used to support the day-to-day operations. The Director and OM were the primary interviewees for this case. The Director had been employed with the ABC Group for over 20 years at the time of the interview. The OM had been employed with the ABC Drugstore for approximately 6 years, but had been in the position of Operations Manager for approximately 3 years at the time of the interview.

The Purchasing Manager and Inventory Controller were also interviewed, regarding specific issues that arose during the study. The Purchasing Manager is responsible for the entire process of identifying items for purchase and preparing and executing Purchase Orders, subject to the approval of the Director and OM. The Inventory Controller is responsible for overseeing the status of the inventory at all store locations and at the central warehouse, and also for supervising the work of the inventory clerks.

5.6.1.2 Competitive Environment

The managers considered the Drugstore's main competitors to be other local retail establishments offering similar products. This included other pharmacy/drugstore operations, supermarkets and discount stores. Management also acknowledged that there was indirect foreign competition in the form of direct bulk importation of items, particularly toiletries, by local consumers. This occurred because customers are able to obtain the goods at cheaper prices and happened more frequently during the

Christmas shopping period. A similar situation was also reported with regard to purchases of vitamins online, although the Director was of the view that ultimately those making such online purchases were not satisfied with the products they were getting.

Among the local competitors, the managers believed that those operations that offer a comparable range of goods were the most significant threat, as compared for example, to the smaller pharmacies that specialize in provision of prescription and non-prescription medication. Management acknowledged however, that the smaller competitors appeared to have the following two competitive advantages:

- They have a higher staff to customer ratio that allows them to create a perception of providing more personalized customer service.
- Decision-making, and consequent action, is faster and easier. In many cases, the owner runs the store.

The OM was able to identify at least two competitors who were using the same core retail management application as the Drugstore, but was unable to say whether this fact had an effect on the competitive environment.

5.6.1.3 Competitive Position and Response

The managers considered one of the main competitive advantages to be product differentiation. According to the OM, over the past few years, the Drugstore has pursued a deliberate strategy of differentiating its products from others available in the local market by, among other things, importing a larger proportion of its inventory directly from overseas suppliers as opposed to purchasing through local distributors. During the previous 5 years, the company had reduced the proportion of its inventory purchased from local distributors from approximately 70% to 45% (as per figures quoted by the OM). Not only did this allow for a more differentiated product offering, but in many cases the firm has been able to retail the goods at more competitive prices than similar items sold by its competitors.

The store has also expanded the range of products it offered and tailored its product offerings to better target specific groups. For example, it has increased the offering of cosmetic and fashion items aimed at a younger customer base. With regard to its pharmacy, it now carried a wider range of prescription drugs, making it more likely that customers will be able to fill an entire prescription at the ABC Drugstore, than at a competitor's store.

It also selected the range of goods to be offered at its branch stores based on the perceived buying patterns and interests of customers in the respective geographical areas. For example, the branch store in the north of the island offers a wider range of products of interest to visitors than are offered at the other branches, because it is located in one of the main tourist areas of the island.

Further, the fact that the Drugstore has more branches than its competitors and is

located in key commercial areas is also considered to be a contributor to its competitive advantage as it allowed Drugstore to reach a wider customer base than its competitors.

5.6.2 Resources

5.6.2.1 Technical IT Resources

The Technical IT Resources identified by the study are described below. Table 5-7 shows a summary of the Technical IT Resources.

1. Application Software

The core application used by Drugstore to support its business is an integrated retail and inventory management software package referred to in this study as *INVENSYS*. This application had been in use for approximately 3 years at the time the research was conducted.

INVENSYS provides all the functionality required to process and capture data on all transactions related to the movement of inventory. This includes Inventory Purchasing and Receiving, Customer checkout (including barcode scanning), Customer Credit (Accounts Receivable), Inter-store Transfers, Inventory Physical Count and Inventory Adjustments. It also provides functionality to allow a designated computer at each branch store to dial the designated computer at the main store via a modem/telephone connection, to synchronize data on a nightly basis. The synchronization process, referred to as “polling”, transfers data on all transactions at each branch store to the main store where the data is aggregated in the central database. Updated information on inventory and pricing is also transferred from the central database at the main store, to the branch stores.

2. Information produced by application software

INVENSYS is able to generate several reports and on-screen query results from the transaction data collected by the application. The responses of the interviewees indicated that this information is considered to have significant value separate and apart from the processing capabilities of the application. For example, the OM, in describing advantages the business had derived from its use of IT, stated:

“Now the system gives us better information, we can make better decisions. Information, as they say is power. Once you have the information and you use it properly, you have the power.”

In response to a similar question, the Director stated:

“Purchasing, a big part of our success in the last year or two, has been improved by using the information available from the system in terms of the movement [of inventory].”

The information produced by INVENSYS can therefore be considered to be a separate Technical IT Resource.

3. Hardware and infrastructure

The hardware and infrastructure available to the Drugstore is used primarily to support the functioning of INVENSYS. The main resources available in this regard (as at May 2006) are:

- A server computer which functions as a central repository of all data for the INVENSYS system.
- A total of 15 computer-based point-sale (POS) terminals at the stores. Each such terminal consists of a computer with attached electronic cash register, barcode scanner and receipt printer.
- An additional 2 workstations (one at each of 2 stores) – used for inventory transfers, inventory checks and customer service activities.
- A total of 16 other computer workstations (excluding those mentioned above) at the Head Office and Warehouse.
- The POS terminals, workstations and server at the main store, warehouse and head office are all connected via a Local Area Network (LAN) and have direct access to the central INVENSYS database.
- A LAN at each of the branch stores connecting all POS terminals and other computer access points located within that store.
- At each branch store, one of the POS terminals also functions as a server, hosting the store’s copy of the INVENSYS database. This can be accessed by all other computers within the store via the store’s LAN.
- Modems and telephone lines at each of the branch stores and at the main store that allow one computer at each branch store to make contact with a computer at the main store.

There is presently no Wide Area Network (WAN) connecting the branch stores with the main store.

Table 5-7: Technical IT Resources for Drugstore

	Resource	Description/ Remarks
1	Application Software	<i>INVENSYS</i> : Integrated retail and inventory management application that includes features for: Retail checkout (including barcode scanning), Customer Credit (Accounts Receivable), Sales Analysis and Reporting, Purchasing, Receiving, Inter-store Transfers, Inventory Management, Multi-store integration. Also, software to support nightly transfer of data between main store and branch stores.

	Resource	Description/ Remarks
2	Computer Access Points	Total of 33 computer access points comprised as follows (a) 15 point-of-sale POS terminals distributed through the 5 stores for retail checkout, customer service and in-store management functions. Each POS terminal consists of a computer running the application software, a receipt printer, a barcode scanner and an electronic cash drawer controlled by the software. (b) 2 workstations – 1 each available at 2 of the stores for use in inventory transfers, inventory lookups and customer service (c)16 computer workstations available at Head Office and Warehouse to support Sales Analysis, Purchasing, Receiving and Transfer of Goods between stores. Also allows management access to aggregated data from all stores and warehouse, and to view and query transactions performed at individual stores.
3	IT Infrastructure	(a) Local Area Network (LAN) connecting all computers within the Main Store, Warehouse and Head office to the main server. Computers at these locations have real-time access to the transaction data in the retail system database residing on the server. (b) Telephone lines and modems that allow branch stores to transfer data on daily transactions to the main store on a nightly basis and also download updated data on inventory and prices from the main store on a nightly basis.
4	Information produced by application	Information contained in reports and on-screen queries, produced from data captured by the application. Specific information identified includes: (a) Information on sales targets and performance used by Store Managers to decide additional actions need to meet performance targets (b) Information on the availability of inventory at specific locations used to advise customers, and to make decisions on inter-store transfers (c) Information used for accounting and financial management purposes.

Source: Compiled by author

5.6.2.2 Human IT Resources

The Human IT Resources available to Drugstore consist of IT technical skills for supporting the Technical IT Resources as well as skills for managing and using the available IT resources. These are described below. A summary of the Human IT Resources is shown in Table 5-8.

1. Technical IT Skills

The Technical IT skills available to Drugstore are provided by the central Group IT Department of the ABC Group of Companies. The IT Department is responsible for

deploying and supporting the Drugstore's IT applications and hardware, and generally assisting or advising on technical IT matters. The Department has a full-time staff of 5 persons, which includes the IT Manager. One IT staff member is assigned as the primary IT Support Officer for the Drugstore, and is the first point of contact within the IT Department for IT assistance to the Drugstore. However, if the designated support officer is unavailable, or if additional technical manpower and skills are required, other members of the IT staff provide assistance. Additionally, the IT Department has a standing arrangement with a local IT consulting firm that is able to provide further technical assistance when required.

2. Skills for Managing and Using IT Resources

Within the Drugstore staff, there are no IT specialists. However, there are varying levels of skill and responsibility among the staff in using the available IT systems. In particular:

- The *Inventory Controller (IC)* is responsible for ensuring the accuracy of inventory data. This includes executing reports and queries from the available menu options in INVENSYS to check inventory data and determine accuracy. The Director explained the importance of the role of the IC by stating:

“The accuracy of our accounts has improved. I would say quite tremendously . . . this boils down to the key thing with having an Inventory Controller, a good Inventory Controller and other people who are focused on the accuracy of the data and the systems in place to record and monitor all adjustments and things like that.”

- The management team, comprising the Director, the Operations Manager, the Pharmacy Manager and the Store Managers are able to use reports produced by the system for supporting their decision-making, particularly with regard to deciding which items to purchase and what quantities. As stated in the discussion of Technical IT Resources above, the use of information produced by the INVENSYS application was identified as a major reason the firm had benefited from it. Thus, the ability to use this information appropriately is one of the Human IT Resources possessed by the Drugstore.
- The OM identified a management team comprising herself, the Director and the Inventory Controller, rather than the IT Department, as the one who were responsible for “driving” the increased use of IT within the firm. This was in response to a question as to who she considered responsible for “driving this increase use of the system and the improvements that are taking place”. This skill is a Human IT Resources as it contributes to the ability to derive benefit from the IT Resources.
- Drugstore management is able to identify INVENSYS-related problems as being “operational” or “technical”. This ability allows Drugstore to be more self-sufficient in support, as explained by the OM:

“...we’ve separated operational issues vs technical issues and when its operational we deal with it ourselves, and if there is nothing else we can do, we will ask them [the IT Department] “how do you do this, why I am getting this report, what do I do?”

Table 5-8: Human IT Resources for Drugstore

	Resource	Description/ Remarks
1	IT Technical Skills available from IT Department	The IT Department is responsible for providing implementation and technical support services to the Drugstore.
2	Ability to use system information for analysis and decision-making	Respondents attributed much of the benefit they derived from the IT system to their ability to use the information produced, for decision-making.
3	Ability to separate “technical” and “operational” IT issues for resolution	The ability to separate IT issues as “technical” or “operational” allows the Drugstore becomes more self-sufficient in resolving “operational” issues.
4	Ability to “drive” IT from within Business Unit	The OM identified a management team comprising herself, the Director and the Inventory Controller, rather than the IT Department, as the one who were responsible from “driving” the increased use of IT within the business.
5	Skill to maintain accuracy of data	The Director attributed significant improvements in data accuracy to the efforts of the Inventory Controller and others.

Source: Compiled by author

5.6.2.3 Complementary Organizational Resources

Specific non-IT attributes and skills that allowed Drugstore to take advantage of the potential benefits offered by its IT systems were identified. These included a new management structure that provided for greater responsibility and accountability among the managers, particularly the Store Managers. A summary of the Complementary Organizational Resources identified is shown in Table 5-9.

1. Management Structure and Responsibilities

Recent changes to the organizational structure of the Drugstore resulted in a management structure that allowed greater advantage to be taken of the available IT resources. Drugstore created new management positions and assigned responsibilities that the OM credits for improvements in system use and improved business performance. This was explained as follows:

“We now have a new Chief Pharmacist, a new Inventory Controller which was very important, a new Warehouse Manager; relocated some of the senior staff; made some supervisors Store Managers giving the responsibility for the entire store so you manage it, manage the products”.

In further illustrating how the assignment of greater responsibilities to Store Managers has affected the way they used the available IT resources, the OM stated:

“We have given them [access] privileges ... If you go to the store in the morning, you will see [the Store Manager] reviewing her report on sales for the day before.... They compare the sales for the previous day ... the previous year ... by categories ... This is done on a regular basis. They check the inventory ...”OK, a customer wants this”. I don’t have this, but let me see where else has it. They’ll go into the system “Oh, I seeing one at [Branch 1]. Would you like to buy it at [Branch 1], or would you like me to transfer it down here?” The fact that the system is there ... they use it to see where there are products.”

2. Availability of Funds to support IT investment

Both the OM and Director were of the view that the availability of funding was not a constraining factor for decisions on IT investment. The OM also believed that the availability of finance gave the firm an advantage over its competitors:

“Financially ... which is one of the advantages ABC has over its competitors ... the money is there ... I don’t have a problem if I want something ... once I can justify it, I can get it. All I need to do is to justify it ... say why I need it, and I will get it. So money is not a problem, when it comes to my department, for anything.”

The Director, in commenting on whether the availability of financial resources to invest in and support IT was a factor that helped or hindered the use of IT within the firm stated:

“I don’t think that is a factor at all. The financial factor, if you go back and see what we have spent, I don’t know if you benchmark that over similar type businesses what we are spending compared to others, but it depends if you are comparing us islandwide or within the region or first world country, but for our size I think we spend a significant amount in that area.”

Also important was the availability of funds that ensured that investments in IT could be made, if the senior management considered them to be justified. There was evidence of support for IT investment and use of IT by senior management. The CEO, GFD and IT Manager all stated that availability of funding for investment in IT was not a constraint.

3. Support for IT use by Management

The OM considered management and staff to be supportive of the use of IT. This was particularly so with regard to the Director of the Drugstore, who, according to her “thrives on the system”:

“My Director literally thrives on the system. That’s where he gets his reports ... He will use the reports and will ask ‘why is that there’, or ‘look at the margin this is showing’ ... He is very much into it, and for the management staff, I actually got them to be into it.”

The Director’s enthusiasm for the system as suggested by the OM, was reflected in his comments about additional benefits he would like Drugstore to derive:

“Another benefit is customer information, in terms of what people are purchasing, the trends and again it is something we do not spend enough time on, getting a database on customers is something that we need to focus on in the future in terms of capturing more information on the sales, if not a loyalty programme but something that we can capture who is buying what and breaking it down into terms of the persons age, what bracket they fall into and using that information to plan ahead to help with your purchasing and what goods you will move away from for whatever reason ...”

Table 5-9: Complementary Organizational Resources for Drugstore

	Resource	Description/ Remarks
1	New Management positions and responsibilities	Drugstore created new management positions and assigned responsibilities that the OM credits for improvements in system use and improved business performance.
2	Availability of funds to invest in IT where perceived to be justified	Statements by both the OM and Director supported the view that the availability of funding was not a constraining factor for decision on IT investment. The OM also believed that the availability of finance gave the firm an advantage over its competitors:
3	Use of IT by Management	Drugstore management, in particular the Director, was very supportive of IT

Source: Compiled by author

5.6.3 Contributions

The following were identified as contributions made by the firm’s IT to its competitive position. A summary of the contributions is shown in Table 5-10.

1. Information on trends to make decisions

The OM identified the easy availability of information on sales and trends that can be used for decision-making as a significant benefit from the available system:

“... I can go into the system right now and say show me my gross profit for such and such a category of items ... show me how it had been for the past 3 years, so I can see if there’s a trend ... is it increasing? Is it stagnant ... you know ... if you see a trend ... you can manipulate the information as you need to make decisions, so you actually use the information.”

She also stated:

“I like the fact that I can go on the system at any time and get a report on sales ... I can get my margins ... I can check on an item and see where it is ... I can see who has it ... I can do a history on an item to see how it’s been selling ... whether we have to mark it down ... you know ... that information is important to me, and the fact that we don’t have to wait on Finance to find out how my department performed in any one month is definitely a plus for me.”

The OM’s views in this regard were also reinforced by comments by the CEO, on the benefits that the retail businesses were deriving from IT: He stated:

“[In the past] we have made our decisions based on what we thought or what we felt or what we believed, as opposed to what we knew. Now we are migrating to where our staff can actually say I know that this product sells. Whereas before they said ‘I don’t think it’s fast moving’ now they can say I know that that units sells 25 units per week.”

2. Use of system information to redirect customers to other store locations

Drugstore had taken advantage of the availability (at the main store) of inventory data for the branch stores to improve customer service and sales opportunities by directing customers to branches where goods were available. The OM illustrated as follows:

“...OK, a customer wants this”. I don’t have this, but let me see where else has this. They’ll go into the system “Oh, I seeing one at [Branch Store 1]. Would you like to buy it at [Branch Store 1], or would you like me to transfer it down here?” The fact that the system is there ... they use it to see where there are products. The pharmacist would go “ I don’t have Voltarin 25mg but [Branch Store 2] has it. Do you live in that area? Would you like to collect it there? Do you want me to get it for you”. The system is again being used.”

3. Improved “buying” through use of system information

Improvements in purchasing were cited by both the OM and Director as a major reason for Drugstore’s improvement in recent years. The use of the INVENSYS application was cited as being a contributor to this. The OM stated that:

“Both the Buyer and the Chief Pharmacist, they go through the report before they can do their purchasing...”

The Director also stated:

“Buying, a big part of our success in the last year or two has been improved by using the information available from the system in terms of the movement...”

Also, in response to the question: “If you think of your overall experience of your use of IT within the Drugstore is there anything that stands out in your mind as being particularly successful or has worked particularly well for you that comes to mind?” the Director stated:

“Accurate information and accurate data, both for the buying and for the accounting.”

4. Improved Accounting information

Use of the INVENSYS application had led to improvement in the accuracy of Drugstore’s accounting information. The Director explained:

“The accuracy of our accounts have improved. I would say quite tremendouslythis boils down to the key thing with having an inventory controller, a good inventory controller and other people who are focused on the accuracy of the data and the systems in place to record and monitor all adjustments and things like that.”

The Director’s claim was also supported by the CEO’s comments, which also emphasized the benefits being derived from improvements in the timeliness of the accounting information. He stated:

“That has been a real benefit, timely financial information allows you to make better corporate decisions on whether it is business units, or whether it is on margins or whether it is on costs or expenses, so that has been a real benefit being able to get timely financial information, from management’s perspective.”

Table 5-10: List of “Contributions” for Drugstore

	Contribution	Description
1	Information on trends to make decisions	Drugstore was able to make better decisions about its operations because of the availability of information from the IT system on sales and trends.
2	Use of system information to redirect customers to other locations	The availability of information on inventory at others stores allowed Drugstore staff to redirect customers to other stores when being sought were not available at the store visited by the customer.
3	Improved “buying” through use of system information	The information available from INVENSYS had allowed Drugstore to make better purchasing decisions, which had let to a significant improvement in the unit’s performance.
4	Improved accounting information	Increased use of IT had led to an improvement in the quality and timeliness of accounting and financial information available.

Source: Compiled by author

5.6.4 Inhibitors

The following inhibitors were identified from the data. A summary of the inhibitors identified for Drugstore is shown in Table 5-12.

1. Managers not making adequate use of IT system

The managers interviewed expressed the view that within Drugstore, the managers were not making adequate use of the available IT systems. According to the OM, the managers were not “optimizing” the use of the system:

“I don’t think we’re optimizing the system. Yes, as far as we can do right now ... yes. I mean the buyer uses it ... both the buyer and the Chief Pharmacist, they go through the report before they can do their purchasing. But is there more we can do? Of course.”

The Director highlighted the problem among store managers within Drugstore and partly attributed it to inadequate follow-up by Drugstore’s managers:

“The follow up in terms of holding them accountable, and follow up from their managers in terms of ensuring that they are doing what they are supposed to be doing and running the kinds of reports and following up on different kinds of discrepancies or adjustments. It is left too much to the inventory controller and inventory clerks to do things that should be done by some of the store managers.”

The OM’s view was consistent with that of the Group Financial Director who stated that:

“Some of the business unit managers, they don’t in my opinion, in all cases maximize the use of the system. Some of them may use it just as a calculator as opposed to a management information tool.”

This was further reinforced by the CEO who believed that the available retail systems were being underutilized, because “we’re just using it as glorified cash registers in some cases”. He further elaborated:

“We’ve migrated from being a zero computer user to being a significant computer user but not made the investment in training people on utilization of the system as opposed to the degree it can be utilized. So we have people that are using it no different than a computer being used exclusively for a word processor or in many of our situations we are using our terminals strictly as a cash register as opposed to an information gathering, evaluating, disseminating tool. So that would be our biggest flaw right now.”

The CEO’s view that the inadequate training contributed to the inadequate use by managers was also consistent with that of the GFD who stated:

“I believe we need to set the bar higher for them [business unit managers] to make further and further demands for the system, but as well we need to have

an environment where they are empowered or they are able to get more from the system whether it be via training, and that is an area that I have not spoken about at all, but there is not enough training within the IT area to maximize those sort of opportunities.”

2. Technical System Problems

Repeated occurrence of “technical problems” when using INVENSYS was identified as a factor that limited Drugstore’s ability to use the system in the way that it wanted. Some of these problems had first been encountered when the software was installed 3 years ago, and had remained unresolved since then. According to the OM:

“We have problems we’ve had since the inception of the system and they’re still there. .. Of course, the list used to be much longer. It used to be pages, now it’s down to half a page. But there are two or three items on that list that we’ve had problems with from Day 1, and we cannot find an answer.”

Two of these technical problems were identified from a subsequent review of notes of meetings between IT Department and Drugstore staff over two 3-month period approximately 1 year apart. The notes showed the following two problems were recurring from one meeting to the other:

- (a) “Errors in committed quantities after item recalc is done”. This meant that the inventory levels displayed by INVENSYS for items where this error occurred were incorrect, and could not be relied on for making decisions on purchasing or sale of inventory. In such cases Drugstore was forced to physically count the quantity of items in inventory
- (b) “End of day polling failed”. The “polling” process which was used to synchronize the sales and inventory data between the main store and the branch stores failed occasionally. In some instances, the IT Department was able to identify the cause of the situation and rectify it, but in some cases the cause could not be determined.

In such cases, the Head Office was unable to obtain correct aggregate data on sales and inventory for the days for which the polling failed, until such time as the data was updated by other means. The Inventory Controller highlighted the problem as follows:

“One of the problems I had was with “polling”. You cannot do any work basically with sales, running of reports, your sales reports for the previous day, closing of drawers, everything. Anything like that cannot be done, if the system was not polled. If it doesn’t go through for one night, two nights ... you have so many people depending on you for information you can’t get.”

The Inventory Controller also reported that in some cases he had to visit each of the branch stores to perform the extract and update operations that would have been done by the polling. In general, polling failure often resulted in a delay of 1-3 days before the data was brought up-to-date at all Drugstore locations. This constrained Drugstore’s ability to make inventory and pricing decisions as the inventory information available to Head Office was not correct and there would be

discrepancies in pricing of items at the various stores if prices were changed during that time but not updated to all stores.

The technical system problems also forced Drugstore to resort to manual methods to overcome the functionality limitations that they caused. The OM in particular, considered this to be a “big constraint” on Drugstore’s operations:

“It’s a big constraint, because some of the things that we cannot do ... it’s major ... it causes excessive work on us ... to use all kinds of manual methods to get the same answers that we would like to get the system to provide. So it’s really a problem at times.”

Another technical issue reported was slow performance of the system at times, particularly when running reports. For example, the Director reported that some reports had to be run at “non-peak times” because of the length of time required to run them.

The IT Officer explained that the slow performance was due to the growing size of the INVENSYS database, and that to resolve it, the database would have to be purged. The IT Department had found this difficult to do so far however, because it could not be done while INVENSYS was in use. The estimated amount of time required for the operation exceeded that the maximum length of time for which the store remained closed (on weekends).

My review of the database technical manual supported the IT Officer’s conclusion that the growing database size contributed to the slow performance of the system. In particular, several tables in the database had exceeded the maximum table size of 2 Gigabytes (Gb) recommended by the vendor.

3. IT Department and Vendor unable to resolve technical problems

Some of the technical problems identified had persisted because neither the IT Department nor the INVENSYS vendor had been able to resolve them. According to the OM, some of these problems had existed since INVENSYS was first deployed in Drugstore:

“The fact is when we got it, not even the IT Department was familiar with it and there are still things they are learning about. So every now and then, we have problems we don’t know what to do, IT doesn’t know what to do ... you’ll call your support system overseas and they’ll say “try this and try that”. We have problems we’ve had since the inception of the system and it’s still there.”

The IT Department acknowledged that there were technical problems that remained unresolved. A prominent example was the occasional failure of the end of day “polling” which has previously been reported to the vendor. In an e-mail to the vendor, the IT Manager stated:

“Polling in general has often been a cause for worry. The process occasionally fails for no apparent reason. For example, a satellite [branch] store would send its file with no problem (modem works fine) then, when it’s the turn for the hub [main store] to transmit, we get a modem connection error. Then the following day the transmission process for the satellite would work with no problems. What has your experience been with other customers in this regard?” (E-mail from IT Manager to INVENSYS vendor, 5 Nov, 2003)

The IT manager indicated that in response to the complaint, the vendor had subsequently suggested that random “glitches” in the telephone line may have been contributing to the problem, but was not able to offer a specific explanation for the problem or a specific solution.

4. Inadequate Purchasing Reports

Although an improvement in purchasing was one of the main benefits attributed to the introduction of INVENSYS, the inadequacy of reports available to support purchasing was limiting the potential contribution. The Director explained that the unavailability of suitable “reorder” reports caused the order process to take too long:

“Buying, a big part of our success in the last year or two has been improved by using the information available from the system in terms of the movement but it still takes too long. The amount of time it takes to make an order is still way too long because different approaches have to be done, the manual work still has to be done because we do not have reorder reports...”

The “different approaches” mentioned above referred to the practice of running multiple reports to show data such as sales history, quantity on hand and inventory turnover for a set of items being considered for reordering. The Purchasing Manager further elaborated on the problem:

“Presently I run two reports to do my buying - especially reordering. To get information as to how the stock is moving within the stores I would have to run two reports, which I find is time consuming whereas I could have maybe run one report to obtain that information. For now I would use the Sales Analysis by Item and this is a very long report depending on the amount of items per supplier, and in addition to that I also run the Stock Status Report.”

She also explained why this was time consuming:

“It takes a lot of time when I have to do orders. It delays the whole process. If I could get just one report, which gives me that information, then it would be beneficial. Another thing, I find, there are times I have to go through ... I have to check the stock and the Sales Analysis. So I have to use two reports and I have to go through each item, and you know I find it really, really takes time.”

Drugstore had attempted to overcome this problem by having the IT Department create a “Suggestion Ordering Report” that would combine the information from the

two reports and calculate a “suggested order quantity”. However, this had not produced the desired results, according to the Purchasing Manager:

“I have tried it but, it hasn’t worked. It takes a very long time to run and several times. When I put in the, whatever it’s asking for, sometimes the reports just comes out blank. I’ve tried it and just given up.”

The failure of the Suggestion Ordering Report was confirmed by the IT Department, who attributed it to performance problems caused by the large and growing size of the INVENSYS database.

5. Store staff not making adequate use of available IT

Some staff within the stores did not take advantage of the ability of INVENSYS to provide up-to-date information on inventory availability. The OM explained with the following example:

“For example this morning ... there was some item and I said “Is this the only one you have”, and the person responsible for that area said “Yes” ... and I went into the system and said “but you’re supposed to have 3”, so she starts looking for it and then the person responsible for confectionery says “you need to check the system more often to see how much it’s calling for, for your items. I do it every day”. You have staff who will do it ... go on the system and find out how much of that I am supposed to have ... yet you have other staff who won’t do it. So you have a mixture.”

One effect of situations such as that described above was that sometimes items were not available on the shelves (“stock outs”) when in fact they were available in the warehouse, leading to lost sales opportunities. Another effect is the potential loss of sales because staff would say that an item is not available when in fact it was. The OM reported that this problem had been verified through the use of “mystery shoppers”:

“There’s a mystery shoppers exercise where I send people out to shop and give them a form to complete and state what the experience was like. And several of the customers would tell me they would ask a sales clerk, do you have such and such an item the clerk would say if it’s not on the shelf, we don’t have it. That response was received several times and you know this just not acceptable. You’re supposed to check and go further and check the system and say OK ... Well if we don’t have but you can get it at [Branch 1] or at [Branch 2]. Or you can get it such and such place. But they will tell the customer straight if it’s not on the shelf we don’t have, and sometimes if they don’t have it on the shelf they probably have it in the back, but that’s not an answer you give.”

Another example cited by the OM was the acceptance of “bad cheques” (cheques subsequently dishonoured by the customer’s bank). Although a listing of such persons was maintained in INVENSYS, this feature was not adequately utilized by the cashiers:

“For example we actually keep bad cheque listing - a listing of people with bad cheques - in the system. This could be utilized by the cashiers but we don’t use it and we still have bad cheques from repeat customers, when the system offers you that privilege.”

The Director concurred that some staff were not making use of the available IT resources, but believed there were noticeable differences in attitude that could be attributed to the age and educational background of individual staff members. He also acknowledged that limited access to computers was a contributory factor. He stated:

“It comes down to education and age again, the older people are reluctant, the younger ones who come in have had some exposure already and are much easier and much more willing to learn and to pick up and to get to know more and to do more but then what it boils down to is what position they are in and how much access do they have to the computer and to the systems.”

The HR Manager concurred that there was a problem of store staff not making the desired level use of the available IT. Presently however, it was difficult to factor this into the staff appraisals because this was not formally required by their training:

“If I’m a cashier, if I’m a sales associate, if you have not required me to do so in the past, then you cannot assess me, and say that I have or I haven’t, because you would like me to. Unless, you have said to me - because the level of staff that we are dealing with - you have said to me, ‘I want when we have customer queries, you go to the computer. This is how you do it. I have shown you how it is done. I have formally trained you on how it is done.’ We can’t really expect that you are going to make use of it, to the degree that we would like”.

6. Limited availability of access points for store staff

Both the Director and the OM identified the limited access to computers at the stores as contributing to lower levels of use than desired. Some of the staff had the skill to make greater use of the system, but were restricted by the limited availability, as the OM explained:

“Some of the sales staff, they can use the system, but some of them point out the problem of insufficient computers, because there is only one they really can go on to, so just the fact they have to wait causes a strain on them. So we have insufficient computers for them to do the work.”

The OM also explained that the problem was more acute the branch stores than at the main store, since staff at the main store had access to a larger number of computers.

“At the branches, you don’t have the amount of computers that you have at the main branch. You are probably constrained by the number of computers ... when can they go on the system to find out “how much am I supposed to have”?

The HR Manager also concurred that the limited access was contributing to the lack of use of the system by store staff. Previously, staff were allowed to use the cashier stations to perform price and inventory “lookups” but this had been discontinued for security reasons.

“If you are going to require me to do a look up, you need to provide me with the resources as well. For example, for security reasons they [sales clerks] can no longer go to any cashiers’ till, to do a look up because we have found that it has created problems. So if they are going to require that, they also have to provide the resources, such that employees can do so.”

The CEO on the other hand, did not consider the limited availability of computers within the stores to be a significant constraint.

“I don’t think it is an inadequate number because for what we are trying to achieve with the system. It’s predominantly a system that we’re using for a front-end service, collecting information, using that information for purchasing, and we don’t have a significant warehouse in the Drug Stores. So even if you could do look ups on information, you wouldn’t be able to quickly access the products because the warehouse is in another location. The store is physically small enough that the staff should virtually be able to locate all the stock that are on premise just by visually locating the product. So there are people that have responsibility for individual categories, so they would have sufficient knowledge of whether or not the product was in stock. So I don’t see that being a significant problem. I wouldn’t see the capital investment being worthwhile, just for customer service on the floors, or price lookups on the floors or product look up on the floors.”

The number of access points available within the stores compared to the number of cashiers and other sales staff, is shown in Table 5-11 below.. At each store, each cashier is assigned to a POS terminal, although all POS terminals are not necessarily in use at the same time. The “Other Store Staff” are other staff assigned to that store who assist with customer service, inventory and sales activities.

Table 5-11: Access Points and Staff Numbers for Stores

Store	POS Terminals	Cashiers	Other Workstations	Other Store Staff	Total Store Staff
Main Store	6	6	1	22	28
Branch 1	2	2	0	3	5
Branch 2	2	2	1	4	6
Branch 3	3	3	0	6	9
Branch 4	2	2	0	2	4
Total	15	15	2	37	52

(Source: Prepared by author from data provided in e-mail message from IT Support Officer for Drugstore, 27 Feb, 2006), and information from HR Department)

As can be seen from Table 5-11, only the Main Store and Branch 2 each have a “non cash register” workstation available for use by other store staff. At the other 3 stores, the staff have access to a computer only when a cashier station is not in use. Given the

HR Manager's statement that use of cashier terminals by other staff was no longer allowed, this meant that at three branches, it was not possible for floor staff to use available computers.

For the main store, the high number of store staff compared to the availability of only one access point seemed initially to contradict the OM's statement that the availability of access points was better at the main store. From subsequent direct observation however, I noticed that staff from the Main Store frequently used access points available within the head office, which is located in the same building.

Another reason identified as contributing to the limited number of access points was physical space limitations, especially at the branch stores. The OM explained as follows:

“There's a space issue. At [Branch2] they still need an additional terminal but where do you put it? At [Branch 2] there's no space - you cannot put it in the storeroom and cannot put it in the staff room. Where do you put it? At [Branch1], where can you put an additional unit? Apart from not having enough terminals you have the space issue. Where do you put it?”

I was able to verify, through discussions with the IT Department as well as physical inspection of 3 of the 4 branches, that the availability of space to locate additional terminals was indeed a constraint. Two problems in particular were observed: (a) that installation of additional terminals would have to be done at the expense of retail space and (b) some additional construction work would be required in order to provide electrical power and network connectivity to any new terminals.

7. Lack of interface to Accounting system

The fact that there was no interface between the INVENSYS system and the ACCSYS accounting system used by Drugstore was identified as a major problem. Due to the absence of an interface, it was not possible to do direct transfer of information between the two systems. This created additional work for Drugstore and also caused inaccuracies and delays in producing financial information.

The Director identified “the timeliness of information from the front end coming into the accounting and the fact that there is still a lot of manual input” as one of the main consequences of this shortcoming. The variances between the data from the two systems were also a major concern, as he explained:

“The year-end problems we've continued to have for the last how many years where we end up having to make these provisions and decisions because of the big variances we seem to get for one reason or the other. Sometimes paperwork can go astray ... that could cause a problem. What we need is live online system to negate some of that. Some of it does revolve around procedures as well, and your checks and balances. So that is an operation that must be looked at as well in conjunction. But to me that is the biggest problem - the fact we have still not interfaced with the back end. It causes all kinds of problems.”

The OM emphasized the problems created by the need for manual transfer of information between the two systems:

“There is too much manual work going into taking the information from INVENSYS ... transferring it to ACCSYS ... of course, once you have the human element involved, you’re almost bound to get errors. I think definitely something needs to be done to interface an accounting system so the information comes from INVENSYS straight into ACCSYS. This is how it’s supposed to be. On that avenue I have major problems.”

She further elaborated on the impact on Drugstore’s workload:

“It’s the IC [Inventory Controller] who has the headache at the end of every month ... it wastes days trying to find out why Finance got that figure and the system is giving us that ... and the discrepancy ... where it is. This can be a major headache every month. It’s really taking away from the IC’s duties just to do that.”

During a subsequent interview, the OM also identified an example of an occurrence of a particularly large discrepancy between data in INVENSYS and the corresponding data in the accounting system. The discrepancy attributed to the lack of a suitable interface:

“It is so bad right now at this very moment for our February statement there is a discrepancy of one million dollars between what ACCSYS has and what INVENSYS has and the accountant is now trying to look for that million dollars. A couple thousand dollars can slip through the crack here and there. A million cannot disappear.”

Drugstore had recognized the need for an interface between the INVENSYS and the accounting system, but according to the IT Department, the current accounting system did not support such interfacing. Drugstore had therefore taken a decision to identify and procure a new accounting system. This process had been delayed however, for two reasons:

(a) Senior management of the ABC Group to determine the implications of changing Drugstore’s accounting system, since currently all the business units used the same accounting system. The Director explained as follows:

“The accounting system that we use as a back end and is still used in so many different areas within the group - there seems to be a reluctance to move away from that. Drugstore started looking at it initially in isolation from the rest, to do our own thing which may then have been then used in other places but then when they started getting involved they said ...”Ok, let’s find one that will not only do Drugstore but do Home Store, Distributors and everywhere”. So then you complicate things, so you start bringing in all other factors into play, and trying to bring in a system to do all things for all people. All different other variables come into play, and that has complicated things.”

This CEO acknowledged that the position adopted at the level of ABC Group management had delayed the procurement of a new accounting system for Drugstore because of the capital investment reflected by the existing systems and concerns about the effect on the corporate accounting platform. However, this position had recently been changed to allow Drugstore to make its own selection:

“One was the capital investment that was made in the existing software and the complexity of moving the corporate entity off its existing platform. So you have a company that using ACCSYS as its accounting software which does not integrate, or is virtually impossible to integrate with the front-end system. So it’s because of it being a conglomerate as opposed to it being a single line business. ...What we are looking at doing is having Drugstore make it’s own decision as it relates to their accounting platform and having something that intergrades with INVENSYS. So now we are looking at software more as an individual business unit decision. So you buy the software that’s right for you and if we have to have a duplication of process it would be between your accounting package and our accounting package as opposed to your front-end and our accounting package.”

(b) Insufficient emphasis was placed on getting a new accounting system. Both the Director and OM attributed this to the unavailability or inability of the accountant to lead the process. According to the OM:

“Not enough emphasis has been placed on getting a better accounting system. I was without an accountant for almost six months. I inherited an accounting staff My accounting department is just a mess - no emphasis was placed on, ‘let’s get another accounting system, although, there was sufficient money in the budget for a system.”

The OM further explained how this had affected the efforts to get a new accounting system:

“There was no one to lead the charge. There was no accountant. There was no one to lead the charge for it ... Although the money was in the budget we started the meetings and everything. There was no accountant to say “come on”. The IT Department figured if you are not interested, I am not interested either. And so everything was just put on hold.”

The Director was also of a similar view, and stated that the previous accountant “never took ownership” of the situation. He further stated:

“The team that has been working on it ... that accountant is no longer there. So it somewhat got taken off the front burner and put on the back burner unfortunately”.

8. Duplicate and incomplete inventory data

The existence of “duplicate codes” within the inventory database was one of the current difficulties identified by the OM who stated:

“We have lots of duplicate codes and you know we have a lot of items without barcodes ... but that is more operational than anything else”.

This “duplicate codes” problem was also alluded to in a meeting on 14 June 2005 between the IT Department and Drugstore where it was reported that “Drugstore is taking steps to use unique codes for the same item irrespective of supplier and cost” (Source: Notes of IT/Drugstore Meeting on 14/Jun/05. Notes provided by Drugstore).

The “duplicate codes” arise where different item codes are assigned to a single item when purchased from different suppliers. The Inventory Controller explained how the situation typically arose:

“We had a situation they call it parallel importing - where we have some of the very same items that ABC Distributors will import – we will want to buy them cheaper from Martinique. It’s basically the same item but because the costs are so very different you find we had to put another code on the item... Because there is this average cost/last cost kind of disparity, we have to create a different code for it. That is still a very big problem. We try to control it, but in some instances we can’t.”

The consequence of this situation was that it made it more difficult to track purchases and sales of these items. This in turn prevented Drugstore from correctly determining total sales of the items and made determining optimum reorder quantities more difficult.

The existence of items without barcodes meant that such items could not be scanned at checkout, requiring the cashier perform a potentially time-consuming search operation in INVENSYS to correctly identify the item. Absence of a barcode could result from the vendor not assigning a barcode, or from Drugstore staff not entering the barcode into the inventory database.

9. Inadequate detail on customer buying patterns

The Director explained that INVENSYS was not providing an adequate level of detail on individual customers’ buying patterns to assist in making purchasing decisions: He stated:

“Another benefit is customer information, in terms of what people are purchasing, the trends and again it is something we do not spend enough time on - getting a database on customers is something that we need to focus on in the future in terms of capturing more information on the sales, if not a loyalty programme but something that we can capture who is buying what and breaking it down into terms of the persons age, what bracket they fall into and using that information to plan ahead to help with your purchasing”.

He further explained that such information was important as it could help Drugstore anticipate changes in customers' tastes and predict how they were likely to respond to new products. He cited "hair products" as a category that was particularly sensitive to changes in customer tastes and one for which such detailed information would be useful.

A review of the INVENSYS documentation showed that it did in fact have the functionality to record which customer made each purchase and to manage a "Customer Loyalty programme". (Source: INVENSYS Release 7.4 User Manual, released in September 2004). However, Drugstore did not have a Customer Loyalty programme and was not using this functionality.

On subsequent enquiry the OM acknowledged that the possibility of introducing a Customer Loyalty programme had been discussed but decisions had not been taken on matters such as issuing cards to customers and the nature of rewards or incentives to be provided to customers.

10. Inadequate training on use of available IT resources

Both the senior managers at the corporate level and the Drugstore business unit stated that there was inadequate training being provided to allow management and staff to take advantage of the available IT resources. The Director attributed it to inadequate spending on training:

"The area we probably don't spend enough is in training and follow up in terms of making sure that we are using the technology to our best advantage, and that the data we are getting going in and coming out is accurate and in a user friendly environment."

He did not attribute the inadequacy of spending to unavailability of funds however, but rather to difficulty in accessing suitable training:

"Where do you go to get that IT training? In the past, we had this person from Trinidad, who was not always the most impressive and quite often did not have the answers. So ... where do you go to get that training? The people you're going to go to- do they know any more than you know yourself?"

The CEO also emphasized the difficulty of getting resource persons with the required combination of knowledge of IT and knowledge of the business operations, to provide training:

"It is not an unwillingness to spend. It is having the resources that can do the training. It is no different than having a car mechanic who may be able to fix your engine but he may not be able to drive. We have the same thing with IT, we have IT people that can certainly install the software, manage the software all of that. But we don't have anybody that is so expert in utilization of the software that we can say - you know what, train that cashier, train that store manager, train that person. We can train them on the basics but we not

training them on utilization of information and that becomes more a higher level of utilization from the managers' perspective for whether its for buying, whether it is for inventory control, whether it's for how we're displaying the product, what products we're displaying where. All these factors can influence profitability."

He pointed specifically to an absence of suitable local expertise as limiting the options available for providing such training, as well as increasing the cost:

"There is not a pool of talent that would have that kind of information or that experience available to you. You cannot train people to do something that you don't know yourself. So unless we're prepared to go externally and bring in people and say OK ...here's the retail expertise, here's how we are using the system, here's how you can use the system. ...The other things is, the cost of bringing in training into an island economy versus the cost of accessing it on a mainland USA or UK or Canada – it is significantly less there, so there is not the barrier to bringing in training. And you may also find that the economies of scale are so much higher there because of the revenues they are able to generate in the context of the U.S. versus St Lucia. That as a percentage of your sales, training becomes a minimal cost whereas here it is a significant investment. So I would say, we're having to generate the bulk of the training internally and hoping our staff will pass it on to the people that they are working with."

The view that the firm's internal training was inadequate was consistent with the views expressed by the HR Manager, who attributed the deficiency to "insufficient IT resources":

"Training internally is not working. I think we don't have sufficient IT resources for it. We initially thought that we would never have to outsource for IT training, that our IT department would be able to work through department by department but the demands on the Department has changed and we have found they are generally not able to provide that sort of support so it is done externally."

Another reason that emerged for limited training for staff, particularly at the store level, was fear of abuse of the system. According to the OM, staff at the cashier and sales clerk levels were only being trained in the use of a minimum of the functionality of the system:

"Now we are a bit apprehensive about teaching people too much because of what they might get involved in so you teach them the minimum and say that's all - just do this."

This limited nature of the training provided was also confirmed by the HR Manager's description of the training provided to store staff:

"Specific to the Drugstore, from an IT perspective they are required to use the point of sale system. Unless you are utilizing it for stock checks as in the inventory persons, the only thing they would be trained to use the system for,

is to scan a customer's items, produce the bill, check to see what a customer says, is there this or is there that, check to see if the system is showing any."

11. Insufficient impetus for improving IT use from within Drugstore

The Director indicated that there was not sufficient impetus coming from within the Drugstore management team to take advantage of the available IT resources. He singled out the OM for being too tied up with "day-to-day issues" to focus deriving these benefits: He explained:

"The impetus should be coming from the Operations Manager but because of her tying herself up more with the day to day issues, she again hasn't focused on that so, I suppose it comes out of the structure too and the fact that middle management is still weak, that our managers tend to get too tied up in day to day and don't spend enough time developing their IT part and training and holding those under them more accountable that is part of the problem."

The Director's view was consistent with those expressed by the Group level executives. The IT Manager characterised the attitude of the "middle management" (business unit managers) within the Group as being "hands-off". He stated:

"In the main I think it still sort of a hands off kind of approach, you know we have these systems to put in place, let us put these systems in place without looking at make a, b and c improvements to our business, we want to change a, b and c processes in our businesses; things are not working too well here let us put in a system and hopefully things will happen without doing a full assessment of what business strategies you want to support, what benefits we are hoping to achieve, I think that is what in main, our middle level management, that is how I would characterize them".

The GFD also believed that middle managers throughout the Group needed to show more initiative to get greater value from IT:

"I believe we have to engender in our management that they should make the computer systems work for them not they work for the computer systems. They need to have more of an understanding that it is there to make them more competitive, they need to use it more, they need to not just be satisfied that it is adding up one and one and getting two, they should be going back and see how does the one get into the system, how can we anticipate getting the solution, what more information would we want and from that it will require us to input a lot of information into the system in order to get those results."

In discussing the lack of impetus by Drugstore management, the Director also identified the related problems of "weak middle management" and failure to hold their staff more accountable for making suitable use of the available IT. These issues are discussed separately below.

12. Absence of specialist in-house IT skill

The Director believed that the lack of focus on deriving full benefit from the available IT resources was due to the absence of persons within the Drugstore with adequate knowledge of IT:

“I think if we don’t really have the in house people who have the experience and knowledge of that and the systems maybe, we are a little weak in terms of the systems in place and the discipline, I suppose.”

In explaining his view on the role of the IT Department in “driving IT” within the Drugstore, he further argued that the IT Department was not the appropriate entity to provide the impetus:

“Unless within the IT Department you have a systems person and they have their function and they have experience I can’t see how we can expect an IT Department to drive that aspect of it. It has to be the management who have had the proper training, including the accounts people. I know in the past people have thought the IT Department should be doing all that but what I have seen in all my years working with computers and IT, I have never seen them provide that function per se, and I think it is wrong to assume they will know your business and be able to advise you how to run your business”

Some of the GFD’s comments on the IT management structure within the ABC Group supported the Director’s contention that the absence of an in-house specialist was an inhibitor, as it put the firm at a disadvantage to competitors. He explained:

“That [the centralized structure] has its drawbacks because you find that the IT people tend not to be as ingrained into a business as some of our competitors may have. A competitor may have an IT person that knows that business inside out, and may even become an integral part of that management team while the IT structures we have, the IT person is used as and when needed and may not be involved enough in being in the proactive or in the planning of the business, and that is something that we are looking at to see how we can entrench IT people in particular business units to make sure they have an ongoing ...that they can anticipate the needs of the business that they are not always going to be reactionary, and that essentially is the plan for the future and that is one of the constraints we have at this point.

Another inhibitor related to the absence of IT specialist skills within the business units was the lack of business-specific knowledge among the IT Department staff. This is discussed in paragraph 14 below.

13. Weak middle management

In discussing the attitude of senior management towards IT, the Director blamed what he considered to be weaknesses in middle management for senior management not having adequate time to sufficiently develop their IT skills:

“Well things have changed a lot but because of the fact that middle management has always been weak, senior management spends too much time doing everyday things and do not spend enough time with developing their skills when it comes to IT, and attempt to do what they need to do to get by, and because of that again, they think they don’t have the time and they probably should spend ...”

The HR Manager was also of the view that weaknesses in middle management were putting additional pressure on senior management:

“As a senior manager you have your own specific portfolio and your junior manager has their portfolio. If your junior manager is not performing at the level which is required it automatically means it is the senior manager, you have to take on more. You will find the senior manager maybe doing his job plus part of the junior manager's job. Which is obviously going to affect that senior manager’s ability to focus on the areas that they need to focus on. If you are constantly being drawn into issues which your junior managers should be dealing with, your time become stretched.”

The Director also alluded to “weak middle management” when explaining why there was insufficient impetus for IT investment and use from within Drugstore:

"...I suppose it comes out of the structure too and the fact that middle management is still weak, that our managers tend to get too tied up in day to day and don’t spend enough time developing their IT part and training and holding those under them more accountable that is part of the problem."

The GFD also believed that the middle management were not attempting to get enough information out of the existing systems, suggesting that they only sought to provide the minimum required by senior management.

“In the present structure, because of our diversity, there is sometimes information you will get at a high level, at a senior management level, in terms of our different business units. Because our time has to be shared you find that the information that we request from each system is pretty limited, and if that is limited then the business unit manager may not necessarily drive for more. So if for example, somebody like myself was managing one type of business unit, my demands for information would probably be much more than what the business unit managers ask for now.”

It was the GFD’s view that the business unit managers should be making greater demands for information.

14. Lack of business-specific knowledge and skills in IT Department

The Director was of the view that the IT Department was not in a position to play the role envisaged in developing IT use within the business, because the IT personnel did not have the requisite business knowledge and skills. This was also related to his view that Drugstore needed to have in-house skills to provide IT assistance. He was also of

the view that because the IT Department supported other businesses within the Group, they did not have expertise specific to any of the businesses:

“You have to develop that within your department and too often the problem is that the IT Department is looked upon as the be all and end all and have to tell you everything and have to teach you everything, they don’t have the skills to do that, they don’t have the knowledge of your business and how your business runs, and they cannot give you that. You have to develop that and bring in the outside people, consultants etc, to help you put in the systems. I don’t think an IT Department, unless you have a really top notch person who has that experience working in those types of businesses who can give you that ...I think that has been the problem in the past, you think the IT Department will solve everything for you and that is not the case, unless you have a GM or director level, or vice president of IT who has that experience who can come in and advise you. How can you get somebody who is an Insurance expert, a Drugstore expert, a hardware expert, a manufacturing expert, or a liquor expert to tell you how to run your business?”

The IT Manager acknowledged that the “detachment” of the IT Department from the business units was an inhibitor. This detachment resulted from the centralized IT structure:

“I think as a result of that [centralized structure] sometimes the IT Department is somewhat detached from the business processes that take place at the companies in the Group; they are not entirely in tune, for want of a better word, with the business process that takes place at the other organizations. I think if there was a more direct involvement with the business side of things, we could see better use of the IT systems.”

Although he pointed to the “greater knowledge within a single department” as an advantage of the centralized IT Department, he conceded that “the fact that the department is away from the others is definitely a hindrance in terms of understanding the business”.

Table 5-12: Summary of Inhibitors for Drugstore

	Inhibitor	Description
1	Managers not making adequate use of system	Managers were not fully utilizing available IT system. Applied particularly to underutilization of information available from system.
2	Technical System Problems	Specific instances of incorrect functioning of INVENSYS were identified that caused information produced to be incorrect or caused delays in availability of correct information. Some technical problems had persisted since deployment of INVENSYS.
3	IT Department and Vendor unable to resolve Technical problems	The IT Department and the INVENSYS vendor had been unable to resolve some of the recurring technical problems identified. This allowed the problems to persist.

	Inhibitor	Description
4	Inadequate Purchasing Reports	None of the available Purchasing reports provided all of the information required to make purchasing decisions. This made it necessary to review multiple reports, leading to delays in the purchasing process.
5	Store staff not making adequate use of available IT	Some floor staff in the stores did not use the IT system for tasks such as monitoring shelf inventory, and responding to customer queries about product availability.
6	Limited availability of “access points” for store staff	The number of access points available for use by floor staff was limited, contributing to the problem of inadequate use mentioned in (5) above
7	Lack of interface to the Accounting system	Absence of an interface between INVENSYS and the ACCSYS accounting system caused additional manual work to transfer data from one system to another. It also led to inaccuracies in the accounting data, and the need to spend additional time on identifying and correcting errors resulting from this.
8	Duplicate and incomplete inventory data	The existence of duplicate item codes made it difficult to determine correct sales figures for the affected items. Absence of barcodes on some items increased checkout time because cashiers had to perform time consuming searches.
9	Inadequate detail on customer buying patterns	Lack of detailed information on the buying patterns of individual customers reduced Drugstore’s ability to anticipate changes in customer tastes and purchase accordingly. Although INVENSYS could support a Customer Loyalty Program, Drugstore was not using that functionality.
10	Inadequate training on use of available IT resources	Inadequate training was being provided to managers and staff to allow them to make suitable use of the available IT.
11	Insufficient impetus for improving IT use from within Drugstore	Insufficient impetus coming from Drugstore management team to take advantage of IT.
12	Absence of specialist in-house IT skill	Drugstore did not have anyone in-house who had the skills to focus on how to derive greater advantage from IT. The managers considered this to be partly responsible for Drugstore not taking greater advantage of IT.

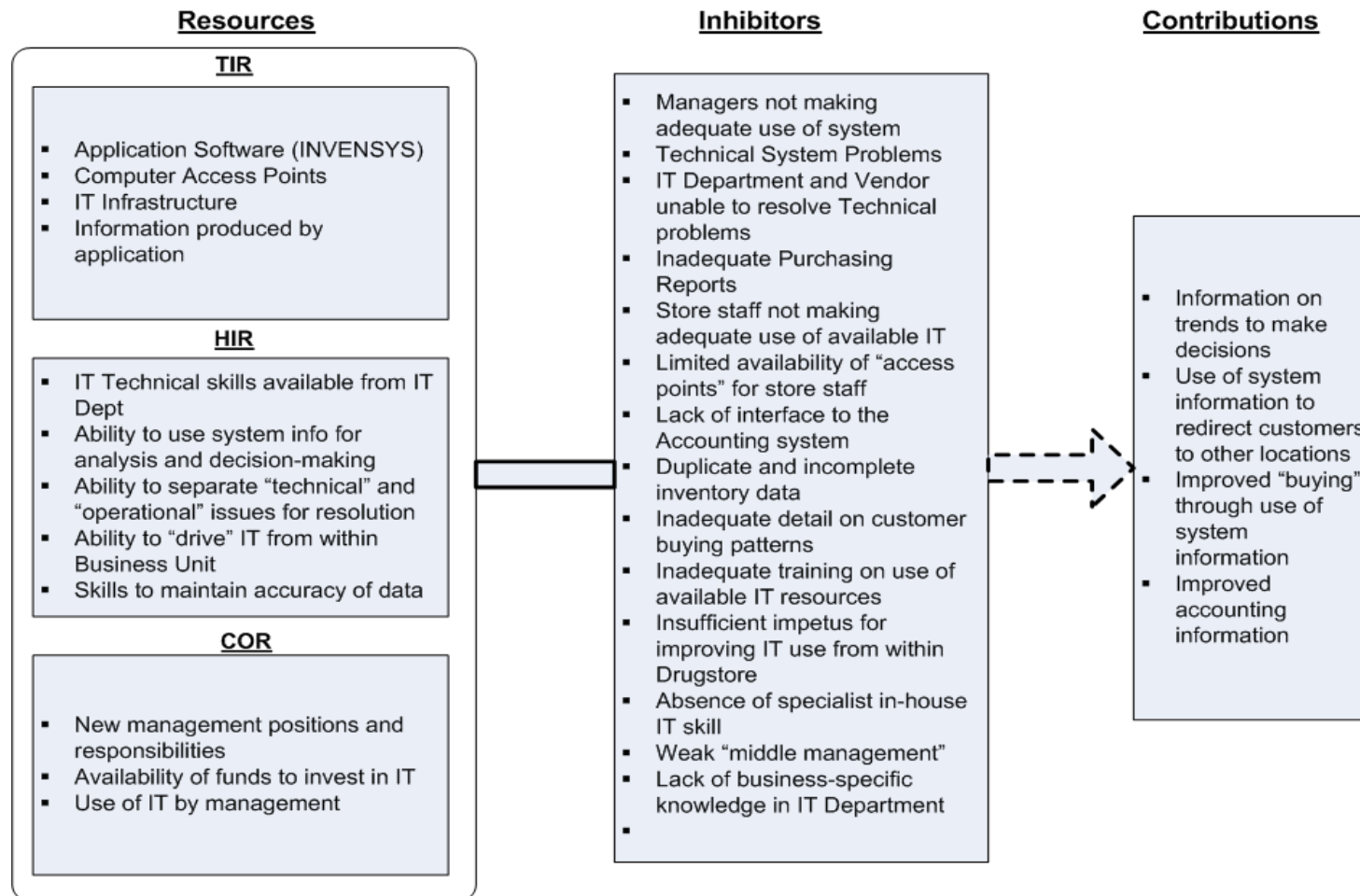
	Inhibitor	Description
13	Weak “middle management”	Because middle management was considered “weak” senior management had to spend more time on day-to-day matters. According to the Director this left senior management with inadequate time to develop IT skills. Also, business unit managers were not making demands for more information, and were not holding subordinate staff accountable for underutilization of available IT resources.
14	Lack of business-specific knowledge in IT Department	The extent to which the IT Department could assist the business unit in taking advantage of IT was limited by lack of knowledge of Drugstore’s business within the IT Department

Source: Compiled by author

5.6.5 Summary of Resources, Inhibitors and Contributions

Figure 5-3 below shows the summary of Resources, Inhibitors and Contributions identified for Drugstore, as described in the Sections 5.6.2 – 5.6.4 above. The diagram was derived by populating the conceptual model described in Section 5.4.3, with the lists of Resources, Inhibitors and Contributions shown in Tables 5-7 to 5-10 and Table 5-12.

Figure 5.3 shows that the combination of resources leads to the contributions to competitiveness identified in Section 5.6.3. The broken arrow signifies that the potential contribution is reduced by the inhibitors identified in Section 5.6.4



Drugstore

Figure 5-3: Summary of Resources, Inhibitors and Contributions for Drugstore (Source: Compiled by author)

5.6.6 Case Analysis and Discussion

5.6.6.1 Analysis of Inhibitors

Table 5-13 describes the cause and effect relationships among the inhibitors derived from the analysis of the data, as discussed in Sections 3.5.3.2 and 5.3.5. Figure 5-4 shows the causal network derived from the data in Table 5-13 also described in Sections 3.5.3.2 and 5.3.5. The causal network provides graphical representation of the relationships contained in Table 5-13.

Table 5-14 shows the list of *inhibiting factors* identified in Table 5-13 and Figure 5-4, and the number of times each one is involved in “To” and “From” relationships, as discussed in Section 5.3.5. Table 5-14 also shows the shortened “node names” used for each of the factors on the causal network to ensure greater readability of the network.

A total of 47 relationships (Table 5-13) among 53 inhibiting factors (Table 5-14) were identified from analysis of the inhibitors described in Section 5.6.4. From Table 5-14, it can be seen that of the 53 inhibiting factors, 8 have a total connection count of 3 or greater, while 18 have a connection count of 2 and 27 have a connection count of 1. This suggests that those with connection counts of 3 or more may be of greatest significance (Tague, 1995).

The nodes with connection counts of 3 or more are listed below, with the number of connections shown in brackets.

- Inadequate training for managers (4)
- Managers not making adequate use of available IT (4)
- Inadequate training for staff (3)
- Store staff not making adequate use of IT (6)
- Insufficient impetus from managers for improving IT use (3)
- Lack of accounting interface (3)
- Polling failure (3)
- Technical system problems (5)

The main effect identified as a result of *Managers not making adequate use of available IT* was that the managers were underutilizing the information available from the system in order to make decisions. Given that the information on trends to make decisions was identified as one of the contributions to competitiveness and that the information produced by the INVENSYS application emerged as a technical resource in its own right, the failure to use this information is considerably reducing the value of INVENSYS as a resource to the Drugstore.

The *Store staff not making adequate use of IT* has several effects on the store’s ability to earn revenue. As can be seen from Figure 5-4, the store lost potential sales

opportunities because staff failed to use the system information to inform customers of the availability of goods at other branches. The non-use of available information to monitor the stock levels in the stores also contributed to “stock outs”. While not explicitly stated, it can be expected that if the goods sought by customers are not made available for sale, this would also lead to lost sales opportunities. The non-use of available features to monitor “bad cheque” writers contributed to Drugstore accepting dishonoured cheques from customers who had previously been identified as “bad cheque” customers, again contributing to loss of sales revenue.

Inadequacy of training - both the *inadequate training for managers* and *inadequate training for staff*, contributed to the *inadequate use* by managers and by store staff respectively. One reason common to both was the inability of the IT Department to provide the required training. Otherwise, different reasons emerged for the inadequacy of training for the two groups.

The *insufficient impetus from managers for improving IT use* also contributed to the inadequate use by managers. As the Director pointed out, the managers were not “driving” IT to the extent required. The unavailability of specialist IT knowledge within Drugstore, and what the senior management considered to be “weak middle management” were identified as the contributors to this lack of impetus.

The *lack of an accounting interface* between INVENSYS and the accounting system (ACCSYS) made it necessary to transfer information between the two systems manually. Discrepancies between the accounting information in INVENSYS and the corresponding information in ACCSYS resulted from the manual transfer process and additional manual work was required to find and correct those discrepancies. Implications of having to do additional manual work would include increased time to get correct accounting information to support decision-making, and additional cost in preparing accounting information. Drugstore management had decided to get a new accounting system to eliminate this problem, but acknowledged that the business unit had not placed the level of emphasis required to achieve this, although funds had been allocated in the budget. The efforts were further delayed by the desire of management at the corporate level to evaluate what implications changing Drugstore’s accounting system would have for corporate accounting practices.

The *Polling failure* inhibiting factor is related to the *Technical System problems* inhibiting factor in that the technical system problems contribute to the polling failure. Since the required information on sales could not be produced until the aggregation from the multiple stores had been done by the polling, the polling failure led to delays in the availability of information, which delayed critical business decisions. On some occasions Drugstore staff had to manually retrieve the required data, giving rise to additional manual work.

The Technical System problems also contributed to the *Slow System performance* that was identified as the reason for the failure of Suggestion Ordering Report – a report that was developed to assist the purchasing process. The unavailability of the Suggestion Ordering Report contributed to delays in the purchasing process since

availability of that report would have reduced some of the manual review that the Purchasing Manager needed to undertake. Technical System problems also contributed to inaccuracies in Inventory data that made it necessary to undertake physical inventory counts to determine true inventory levels.

In 5 instances, inhibiting factors were identified as contributing to “Additional manual work”. These nodes are listed in rows 3-7 in Table 5-14. This indicates that a significant overall effect of the inhibitors faced by Drugstore was that a significant amount of manual work had to be undertaken to overcome its IT limitations, possibly making its labour costs higher than they needed to be.

The relationships identified in Table 5-13, form 6 separate clusters of nodes in Figure 5-4, containing 23, 15, 6, 3, 3 and 3 nodes respectively. None of the nodes in any of these clusters contains a link to a node in any other cluster, signifying that the data did not show any such connection.

5.6.6.2 Case Discussion

From the discussions with the managers, the following competitive advantages were identified, as explained in section 5.6.1.3.

- (a) Ability to offer a differentiated set of products from that offered by their competitors
- (b) Better targeting of products to specific customer groups
- (c) Tailoring products offered at each store to the perceived buying patterns within the geographic area
- (d) Maintaining more branches than competitors to reach a wider customer base

Competitive advantages (a), (b) and (c) above are all at least partially attributable to improvements in purchasing ability, which the Director identified as one of the areas where IT has made the greatest contribution. The 4 contributions of IT to competitiveness identified from data all hinged on the availability and use of improved information to support the decision-making and actions of Drugstore management and staff. Two of these – *Information on trends to make decisions* and *Improved “buying” through use of system information*, contributed directly to advantages (a), (b) and (c).

Thus the information produced by the application emerged as one of the most valuable IT resources for Drugstore, which it was able to combine with the HIR and COR to create contributions to competitiveness. There is support in the literature for the view that the information derived from an IT system is a resource in its own right. Picolli and Ives (2005) for example, state that "Information is now widely recognized as a fundamental firm resource, and organizations are investing significantly to improve their ability to collect, store, manage and distribute it" (p. 755).

Several of the inhibitors, in particular *Duplicate and Incomplete Inventory data* and *Inadequate detail on customer buying patterns* reduced the value of the Information

resource. Given the importance of that resource to Drugstore, these inhibitors were having a significant effect in limiting the contribution that IT could make to Drugstore's competitiveness. Further, the failure of Drugstore's managers to make use of the available IT resources reduced the opportunity to make the resources rare, difficult to imitate and difficult to substitute.

In addition to the competitive advantages identified, one of the competitive advantages identified for Drugstore's smaller competitors was the ability to provide more individualized customer service. While this advantage was attributed to the smaller size of the competitors, Drugstore may be missing an opportunity to undermine this advantage by using the available IT resources to provide better and more personalized customer service. Firstly, Drugstore's staff are not making adequate use of the available system to respond to customer queries, leading to missed sales opportunities when they fail to indicate that items not available on the shelves can be obtained from other branches. Secondly, by not implementing a customer loyalty system, Drugstore is missing the opportunity to collect information about customers that would allow provision of more targeted and personalized customer service.

The availability of more branches provides Drugstore with advantages as it allows the business to reach a wider base, and also tailor its product selection to match the demographics of the target area. Yet the failure of the staff to use the ability of the IT system to redirect customers to other branches when the items being sought are not available at the current branch is inhibiting the potential of IT to contribute to that advantage.

While the data shows that Drugstore's current use of IT is contributing to its competitive advantage, mainly through the provision of information, it also shows that because of the inhibitors identified, Drugstore is missing opportunities to use IT to leverage other resources. This is limiting the extent to which its combination of resources can become rare, imperfectly imitable and non-substitutable, and making it unlikely that the advantages attributed to the IT resources will be sustained.

Table 5-13 – Cause and Effect relationships for Drugstore inhibitors

	Causes	Effects	Description / Remarks
1	Inadequate training for managers	Managers not making adequate use of IT	CEO and GFD identified inadequate training for managers as a reason why they were not making the desired level of use of available IT resources.
2	Managers not making adequate use of available IT	Underutilizing information management capabilities	Managers were underutilizing the ability of the available IT resources to be used for information management and evaluation
3	Inadequate follow-up from managers	Managers not making adequate use of available IT	There was inadequate follow-up from Drugstore’s managers to ensure that the store managers were making adequate use of the available IT.
4	Technical system problems	Unable to rely on inventory quantities	Due to errors in committed quantities, Drugstore was in some cases unable to rely on the inventory quantities shown by INVENSYS
5	Unable to rely on inventory quantities	Need to perform physical count	Since Drugstore could not rely on the quantities shown by the system, it became necessary to perform physical count
6	Need to perform physical count	Additional manual work for physical count	The need to perform a physical count created additional manual work to be undertaken.
7	Technical system problems	End of day polling failure	The end-of-day polling frequently failed for technical reasons that were not resolved by Drugstore or the vendor
8	End of day polling failure	Delays in obtaining information required	When polling failed it became necessary to wait until polling successfully completed or information manually retrieved in order to obtain required information

	Causes	Effects	Description / Remarks
9	Delays in obtaining information required	Critical business decisions delayed	Decisions that required the information such as sales, inventory and pricing information provided through polling had to be delayed until the information could be obtained.
10	End of day polling failure	Additional manual work to update data	Additional manual work required to update data when polling failed. In some cases required visit to stores.
11	Technical system problems	Additional manual work to overcome failures	Necessary to use manual methods to overcome technical failures
12	Technical system problems	Slow system performance	Technical problems with the size of the database and the difficulty in purging caused the system to perform slowly
13	IT Department and vendor unable to resolve technical problems	Technical system problems	Technical system problems had persisted because the IT Department and vendor had been unable to resolve them
14	Inadequate purchasing reports	Additional manual work to produce purchase orders	In order to overcome the inadequacy of the available reports, Drugstore had to undertake more manual effort to produce the purchase orders.
15	Additional manual work to produce orders	Delays in purchasing	The purchasing process took longer because of the additional work required
16	Slow system performance	Suggestion ordering report fails	Report fails to run because of the large size of the database and the related performance problems
17	Suggestion ordering report fails	Delays in purchasing	The failure of the Suggestion Ordering report contributed to delays in purchasing as this report would have simplified the purchasing process
18	Store staff not making adequate use of IT	Inventory stock outs	Inventory stock outs occur because staff not monitoring inventory levels

	Causes	Effects	Description / Remarks
19	Store staff not making adequate use of IT	Lost sales opportunities	Staff failing to check whether goods not on shelves are available at another location. Potential sales opportunities lost because customers not aware goods available.
20	Store staff not making adequate use of IT	Acceptance of bad cheques	Bad cheques accepted from some repeat customers because system not used to lookup customers
21	Older staff reluctant to use IT	Store staff not making adequate use of available IT	Both the OM and the Director reported that the older staff were more reluctant to make use of IT
22	Inadequate training for staff	Store staff not making adequate use of IT	Staff provided with only limited training in IT use to perform their jobs and were not trained in some of the additional features that management wished them to use.
23	Inadequate access points	Store staff not making adequate use of IT	There were too few access points available to store staff to allow the extent of use that management would like.
24	Limited physical space available	Inadequate access points	Space constraints within the branch stores in particular made it difficult to add access points
25	Lack of accounting interface	Manual transfer between accounting system and INVENSYS	Information had to be transferred manually between INVENSYS and ACCSYS because there was no interface that allowed automatic transfer
26	Manual transfer between accounting system and INVENSYS	Discrepancies in accounting information	There were discrepancies in the accounting information due to errors made in manual entry of information between the two systems.
27	Discrepancies in accounting information	Additional manual work to find and correct discrepancies	Resolution of the discrepancies required a significant amount of time from Drugstore staff.

	Causes	Effects	Description / Remarks
28	Management desire to review effect of change of accounting system at corporate level	Lack of an accounting interface	The CEO and Director explained that concern about the possible effects on accounting at the corporate level had contributed to delays in implementing an accounting system for Drugstore
29	Not enough emphasis placed on getting a suitable system	Lack of an accounting interface	The process of selecting a new system was delayed because little emphasis had been placed on making a selection
30	Duplicate “codes” used for inventory	Sales and reorder information incorrect	Since some items had more than one inventory code, it was not easy to correctly determine sales of those items for reorder purposes
31	“Parallel import” purchasing practices	Duplicate “codes” for inventory	Drugstore’s practice of purchasing items from different sources at significantly different prices contributed to the problem of duplicate inventory codes.
32	Items without barcodes	Unable to scan items at POS	Items without barcodes could not be scanned at the Point-of-sale terminals at checkout
33	Unable to scan items at POS	Increased wait time for customers	In cases where items could not be scanned, cashiers had to use the “item search” function, which increased the length of time customers had to wait for checkout
34	Inadequate detail on customer buying patterns	Reduced ability to plan purchasing	Drugstore was unable to anticipate changes in customer buying patterns as well as it would have if it had greater detail on individual customer buying patterns. It could therefore tailor its purchasing decisions as carefully.
35	Non-implementation of customer loyalty programme	Inadequate detail on customer buying patterns	Had Drugstore implemented the Customer Loyalty programme provided by INVENSYS it would have been able to obtain greater detail on customer buying patterns.

	Causes	Effects	Description / Remarks
36	Unable to find local persons with required skills set to provide training.	Inadequate training for managers	Drugstore had difficulty finding resource persons who had the combination of IT and business knowledge required to train managers in effective use of available systems.
37	High cost of providing training from overseas	Inadequate training for managers	The cost of sourcing the training required from overseas was a “barrier” to providing more training for managers
38	IT Department unable to provide adequate training	Inadequate training for managers	The company did not have persons internally with the combination of IT and business knowledge required to train managers. In particular, the IT Department had been unable to provide the required training for managers.
39	IT Department unable to provide adequate training	Inadequate training for staff	The IT Department had been unable to provide the amount of training required for staff.
40	Drugstore practice to provide only minimal IT training for store staff	Inadequate training for staff	Drugstore provided store staff with only the minimal amount of training required to do their jobs. For example, the training did not address the use of INVENSYS to respond to customer queries.
41	System security concerns	Drugstore practice to provide only minimal IT training for store staff	Concerns about staff misusing the system contributed to the practice of provided only the minimal required training.
42	Insufficient impetus from managers for improving IT use	Managers not making adequate use of IT	Managers were not focusing on developing their IT skills and finding ways to use IT
43	Absence of specialist in-house IT skill	Insufficient impetus from managers for improving IT use	Within the Drugstore, the managers had only limited knowledge of the ways in which greater benefit could be derived from IT
44	Centralized IT management structure	Absence of specialist in-house IT skill	The specialist skills available to Drugstore resided in the IT Department and not within Drugstore

	Causes	Effects	Description / Remarks
45	Weak middle management	Insufficient impetus from managers for improving IT use	Weaknesses in the middle management contributed to managers not making sufficient effort to derive greater benefit from IT
46	Centralized IT management structure	Lack of familiarity with business processes by IT staff	The IT Department was not “in tune” with the business processes of Drugstore because of the centralized structure
47	Lack of familiarity with business processes by IT staff	Lack of business-specific knowledge in IT Department	IT Department lacked specific knowledge of Drugstore’s business because they were not sufficiently familiar with the business processes.

Source: Compiled by author

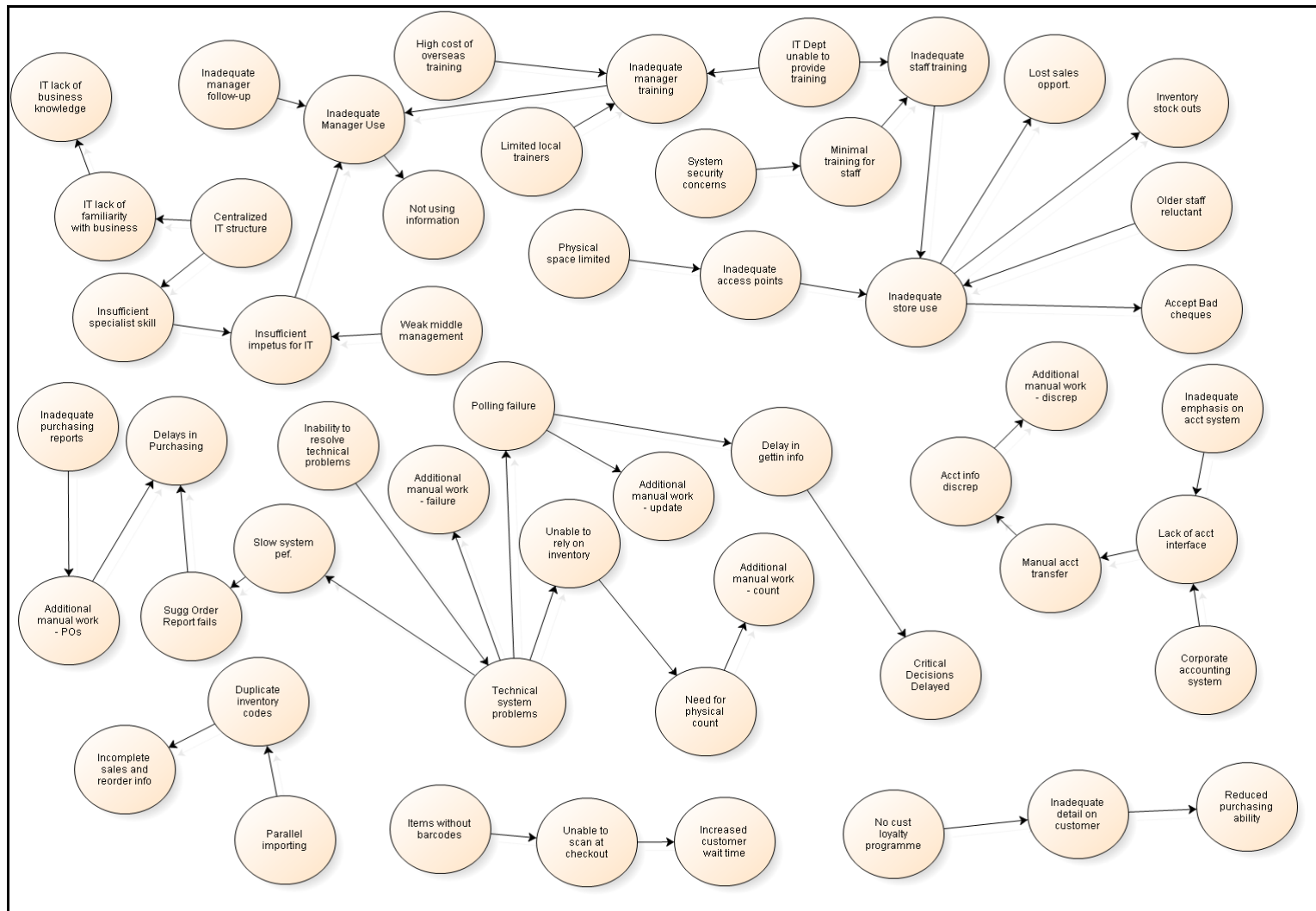


Figure 5-4 – Drugstore Causal Network (Source: Compiled by author)

Table 5-14 Listing of Drugstore Inhibiting Factors

	Inhibiting Factor	Node Name (used in Causal Network)	Connection Count		
			TO	FROM	TOTAL
1	Absence of specialist in-house IT skill	Insufficient specialist skill	1	1	2
2	Acceptance of bad cheques	Accept bad cheques	1	0	1
3	Additional manual work for physical count	Additional manual work - count	1	0	1
4	Additional manual work to find and correct discrepancies	Additional manual work – discrep	1	0	1
5	Additional manual work to overcome failures	Additional manual work – failure	1	0	1
6	Additional manual work to produce orders	Additional manual work - POs	1	1	2
7	Additional manual work to update data	Additional manual work - update	1	0	1
8	Centralized IT management structure	Centralized IT structure	0	2	2
9	Critical business decisions delayed	Critical decisions delayed	1	0	1
10	Delays in obtaining information required	Delay in getting info	1	1	2
11	Delays in purchasing	Delays in purchasing	2	0	2
12	Discrepancies in accounting information	Acct info discrep.	1	1	2
13	Drugstore practice to provide only minimal IT training for store staff	Minimal training for staff	1	1	2
14	Duplicate “codes” used for inventory	Duplicate inventory codes	1	1	2
15	End of day polling failure	Polling Failure	1	2	3
16	High cost of providing training from overseas	High cost of overseas training	0	1	1
17	Inadequate access points	Inadequate access points	1	1	2
18	Inadequate detail on customer buying patterns	Inadequate detail on customer	1	1	2
19	Inadequate follow-up from managers	Inadequate manager follow-up	0	1	1
20	Inadequate purchasing reports	Inadequate purchasing reports	0	1	1
21	Inadequate training for managers	Inadequate manager training	3	1	4

	Inhibiting Factor	Node Name (used in Causal Network)	Connection Count		
			TO	FROM	TOTAL
22	Inadequate training for staff	Inadequate staff training	2	1	3
23	Increased wait time for customers	Increased customer wait time	1	0	1
24	Insufficient impetus from managers for improving IT use	Insufficient impetus for IT	2	1	3
25	Inventory stock outs	Inventory stock outs	1		1
26	IT Department and vendor unable to resolve technical problems	Inability to resolve technical problems	0	1	1
27	IT Department unable to provide adequate training	IT Dept unable to provide training	0	2	2
28	Items without barcodes	Items without barcodes	0	1	1
29	Lack of accounting interface	Lack of acct interface	2	1	3
30	Lack of business-specific knowledge in IT Department	IT lack of business knowledge	1	0	1
31	Lack of familiarity with business processes by IT staff	IT lack of familiarity with business	1	1	2
32	Limited physical space available	Physical space limited	0	1	1
33	Lost sales opportunities	Lost sales opport.	1		1
34	Management desire to review effect of change of accounting system at corporate level	Corporate accounting system	0	1	1
35	Managers not making adequate use of available IT	Inadequate manager use	3	1	4
36	Manual transfer between accounting system and INVENSYS	Manual acct transfer	1	1	2
37	Need to perform physical count	Need for physical count	1	1	2
38	Non-implementation of customer loyalty programme	No cust loyalty programme	0	1	1
39	Not enough emphasis placed on getting a suitable system	Inadequate emphasis on acct system	0	1	1

	Inhibiting Factor	Node Name (used in Causal Network)	Connection Count		
			TO	FROM	TOTAL
40	Older staff reluctant to use IT	Older staff reluctant	0	1	1
41	Parallel import purchasing practices	Parallel importing	0	1	1
42	Reduced ability to plan purchasing	Reduced purchasing ability	1	0	1
43	Sales and reorder information incomplete	Incomplete sales and reorder info	1		1
44	Slow system performance	Slow system perf.	1	1	2
45	Store staff not making adequate use of IT	Inadequate store use	3	3	6
46	Suggestion ordering report fails	Sugg Order report fails	1	1	2
47	System security concerns	System security concerns	0	1	1
48	Technical system problems	Technical system problems	1	4	5
49	Unable to find local persons with required skills set to provide training.	Limited local trainers	0	1	1
50	Unable to rely on inventory quantities	Unable to rely on inventory	1	1	2
51	Unable to scan items at POS	Unable to scan at checkout	1	1	2
52	Underutilizing information management capabilities	Not using info	1	0	1
53	Weak middle management	Weak middle management	0	1	1

Source: Compiled by author

5.7 Case 2 – ABC Home Store

5.7.1 Case Overview

5.7.1.1 Background

ABC Home Store imports and sells hardware, building materials, small appliances and household supplies. It is the ABC Group's largest retail operation (in terms of revenue) and currently has 4 branches. The main branch is located just outside Castries on a major traffic thoroughfare. The second branch is located within central Castries, in close proximity to ABC Head Office, while the third branch, which specializes in building materials, is also located within the city of Castries. The fourth branch, which was recently opened, is located in the north of the island. The main retail outlet was opened in late 2000. Prior to this, the company had been involved in the hardware retail business for several decades, and the branch located in central Castries was previously the main retail outlet.

Overall management of the ABC Home Store subsidiary is the responsibility of the General Manager (GM), who is also a member of the ABC Group Board of Directors. Specific day-to-day operational management however, is the responsibility of the Operations Manager (OM). Like all the other businesses within the ABC Group, IT support for ABC Home Store is provided by the central ABC Group IT Department.

ABC Home Store had recently changed its core IT application, which is a retail and inventory management system. Unlike the previous application which was designed for smaller operations and used a desktop-class database (Microsoft Access), the new one was designed for larger scale operations and based on a server-class database (Microsoft SQL Server). The new system was also designed to support multiple locations and contained comparatively advanced functionality and reporting features.

The GM and OM were interviewed for the study. The GM had been with the firm for approximately 8 years at the time of the interview while the OM had been with the firm for approximately 6 years. Both of them had been employed in ABC's hardware business prior to the opening of Home Store in 2000.

5.7.1.2 Competitive Environment

With the exception of one competitor, ABC Home Store did not perceive any of its local competitors as being able to offer the same range of products and services. Instead, different firms were competing with different "Departments" within ABC Home Store. For example, one firm was identified as a major competitor for the Electrical Department, while another was cited as a major competitor in some building materials. Only one firm was identified as offering a comparable range of items, but Home Store did not consider it to be a very strong competitor.

The GM and OM acknowledged that there was some foreign competition in the form of potential customers choosing to purchase items overseas. They both believed

however that this had reduced in recent times and that for most customers this did not work out to be cost effective. The OM was also of the view however, that the absence of a strong competition in the local market actually made the market more attractive to foreign firms and increased the likelihood that such firms may choose to enter the local market.

While the fact that Home Store offered a wider range of goods was considered an advantage, the managers also acknowledged that the competitors derived some advantages from their narrower product focus. In particular, one of the advantages of some of the competitors was better product knowledge in the areas where they competed. This translated into being better able to negotiate with suppliers and making better purchasing decisions.

A notable change in the competitive environment in recent years is that two of Home Store's competitors have dropped out of the market. One of these, which covered several of the same lines of items as Home Store, has gone out of business, while a second, which mostly competed with Home Store's Electrical department has exited that line of business. In the meanwhile, Home Store and some of the other remaining competitors had expanded their operations in an effort to increase their market share to take advantage of this. The GM stated:

“When we did have that downturn, a lot of our competitors fell by the wayside and the market became a lot smaller with regard to suppliers, but bigger with regard to market share after that.”

Another notable change was in discounting policies. Competition in this line of business in St Lucia has been characterized by heavy discounting to attract customers and retain loyalty. This had reduced in recent years however, as the OM explained:

“In terms of it [the market] being more competitive, about 2 years ago I can say that it was ... the market was much more competitive because of heavy discounting that was occurring. You found that we had to follow the lead of the market trend in terms of discounting. That was something that we weren't happy to do, but we had to do because that's what the market dictated. You found that over the last year or so, the dependence on discounting ... we've actually reduced our discounting quite significantly, so that has ... that's one factor that has changed. The competition as well has stopped advertising and throwing out the idea of discounting.”

While some competitors had dropped out of the market, in recent times, new competitors had entered. Among these were some businesses that were traditionally involved in retailing textiles and soft goods. There were two characteristics of the way they conducted business that the OM perceived as having the potential to change the competitive environment (a) they were more willing to “haggle” prices with customers and (b) they purchased items from stores like Home Store for resale at their general merchandise retail outlets.

Home Store had not made any specific attempt to compare its use of IT to that of the competition and the managers did not have details of the systems used by competitors. The OM believed however, that one key competitor was able to derive an advantage from its information system because the length of time required by the competitor to process import shipments and make the goods available for sale was considerably shorter than that taken by Home Store.

5.7.1.3 Competitive Position and Response

Many of the competitive advantages identified during discussions can be attributed to the size of the business, vis-à-vis its competitors. This was described by the OM as follows:

“Location, number of outlets, the variety and product availability is much greater, therefore we are more attractive in the eyes of the consumer as a one-stop shop, because of the variety and the different locations that we have; of late we have made improvements to our point-of-sale system and that enabled one branch to sell goods out of another branch - goods that are not at the branch. They are able to see the quantities and sell it if so desired, so that made them, again, even more attractive, in terms of shopping, as a destination.”

It is noted that the advantage attributed to the introduction of a new point of sale system is the ability to provide improved customer service by giving customers access to the goods wherever they are available.

The CEO of the ABC Group also considered size to be one of Home Store’s sources of competitive advantage. He stated:

“In Home Store, I think we are in a position because of our size... I don’t believe anybody on island is sufficiently strong to challenge us, our biggest challenge is ourselves... because we are the dominant player I think we have the advantage.”

The company had strong buying power with suppliers, because it was able to buy relatively large quantities, compared to local competitors. This led not only to better pricing, but also better credit terms from suppliers. The ability to buy in larger quantities was attributed to the fact that it carried a wider range of goods and to its ability to carry more inventory because of larger premises and more warehouse space. The stronger buying power was also attributed to the firm’s association with a buying cooperative in the US.

The managers believed that the company’s use of IT had contributed to its strong competitive position. The GM stated:

“A lot of companies who did go to IT have definitely benefited from it ... I don’t think the others have done as good a job as we have. I think if they do, they will become a lot more competitive against us.”

The company's access to an IT Department "which is well-staffed with knowledgeable staff" was also cited as one of its advantages compared to the competition. While the OM reported that that ABC Home Store's Strategic Plan cited a "strong IT Department" as one of its advantages, he admitted that the Plan did not elaborate on how this perceived strength would translate into an actual benefit.

"The document identified that one of the competitive advantages was a strong IT Department, but it did not go into detail to say that because we have a strong IT Department, we will now be better able to do X, Y and Z versus the competition who will not be able to do those things"

One specific area where improved IT was identified as contributing to the firm's competitive position was in Wholesaling. According to the OM, the Strategic Plan had identified Wholesaling as an opportunity that the company should pursue, but that previously its systems did not support the setup of wholesale prices and the strict control of the use of those prices. In the past therefore, to the introduction of Wholesaling without the required controls could result in the company simply selling the goods at discounted prices with no overall benefit. However, with the introduction of the new retail management application, it was now able to implement the desired pricing structure and the controls to monitor it.

5.7.2 Resources

5.7.2.1 Technical IT Resources

The Technical IT Resources identified by the study are described below. Table 5-15 shows a summary of the Technical IT Resources.

1. Application Software

The main application used by Home Store to support its business is an integrated retail and inventory management package referred to in this study as *INVENSYS SQL*. This application was in use for approximately 1 year at the time the initial interviews were conducted.

INVENSYS SQL provides all the functionality required to capture data on all transactions related to the movement of inventory. This includes Inventory Purchasing and Receiving, Customer checkout, Inter-store Transfer, Physical Count and Inventory Adjustments. It also provides functionality to allow inventory and sales data from each branch store to be transferred to the server at the main store at regular intervals throughout the day, using database replication. The synchronization process transfers data on all transactions at each branch store to the main store where it is aggregated. Updated information on inventory, pricing, user privileges, and other information that affects the way the application operates, is also transferred from the main store to the branches.

2. Hardware and Infrastructure

The hardware and infrastructure available to the Home Store is used primarily to support the functioning of INVENSYS SQL. The main resources available in this regard are:

- A server computer at the main store which functions as a central repository of all data for the INVENSYS SQL system.
- Two (2) additional servers at the branch stores used for running the application at these stores and for replicating data to the main store.
- A total of 14 computer-based point-sale (POS) terminals at the stores. Each such terminal consists of a computer with attached electronic cash register, barcode scanner and receipt printer.
- A total of 52 other computer workstations (excluding the POS terminals mentioned above) at the Head Office, stores and Warehouse.
- The POS terminals, workstations and server at the main store and head office are all connected via a Local Area Network (LAN) and have direct access to the central INVENSYS SQL database.
- A LAN at each of the branch stores connects all POS terminals, server and other computer access points located within that store.
- There is a Wide Area Network (WAN) that connects all the stores and allows database replication between the server at the main store and the servers at the branch stores at regular intervals throughout the day. During the time that the research was conducted, this interval was set to 15 minutes.

Table 5-15: Technical IT Resources for Home Store

	Resource	Description/ Remarks
1	Application Software	INVENSYS SQL integrated retail and inventory management application that includes features for Inventory Purchasing and Receiving, Customer checkout (including barcode scanning), Inter-store Transfer and Physical Count and Inventory Adjustments. It also provides functionality to allow inventory and sales data from each branch store to be transferred to the server at the main store at regular intervals throughout the day, using database replication.
2	Computer access points	Total of 66 access points comprising (a) total of 14 computer-based point-sale (POS) terminals at the stores. Each such terminal consists of a computer with attached electronic cash register, barcode scanner and receipt printer. (b) total of 52 other computer workstations (excluding the POS terminals mentioned above) at the Head Office, stores and Warehouse.

	Resource	Description/ Remarks
3	Other hardware and infrastructure	<ul style="list-style-type: none"> • A server computer at the main store which functions as a central repository of all data for the INVENSYS SQL system. • Two (2) additional servers at the branch stores used for running the application at these stores and for replicating data to the main store. • Local Area Network (LAN) connecting all access points at main store to the central INVENSYS SQL database. • LAN at each branch stores connecting all access points within that store. • Wide Area Network (WAN) connecting all the stores and allowing database replication between the server at the main store and the servers at the branch stores.

Source: Compiled by author

5.7.2.2 Human IT Resources

The Human IT Resources available to Home Store consist of IT technical skills for supporting the Technical IT Resources as well as skills for managing and using the available IT resources. These are described below. A summary of the Human IT Resources is shown in Table 5-16.

1. Technical IT skills

The Technical IT skills available to Home Store are provided by the central Group IT Department of the ABC Group of companies, who are responsible for deploying and supporting the Home Store IT applications and hardware. The Group IT Department has a full-time staff of 5 persons, which includes the IT manager. One IT staff member is assigned as the primary IT Support officer for the Home Store, and is the first point of contact within the IT Department for IT assistance to the Home Store. However, if the designated support officer is unavailable, or if additional technical manpower and skills are required, other members of the IT staff provide assistance.

The IT Department reported that the IT Officer assigned to Home Store spends a minimum of 3 days per week on-site at the Home Store’s main store and head office. Additionally, the IT Department has a standing arrangement with a local IT consulting firm that is able to provide further technical assistance when required.

According to the OM, Home Store’s Strategic Plan “identified that one of the competitive advantages was a strong IT Department”. He also drew attention to the role of the IT Department in ensuring that the right IT equipment was procured:

“Basically, the program that we run dictates what specs the machines should be. So if we requested something lower than what the software dictates, then obviously, the IT Department would not approve of it. If we’re going beyond

that, then the questions would be asked, and really and truly, we haven't seen a need to go beyond what the software dictates we should have.”

2. Skills for Managing and Using IT Resources

Within the Home Store staff, there are no IT specialists. There are skills available among the staff however that contribute to the company's ability to use the available IT systems. The following were identified:

- Home Store sales floor and administrative staff need to be able to use the available systems for the day-to-day work and are able to do so. The OM explained:

“...The way the business is structured, the sales floor ... and even the administrative department is structured ... work cannot be done if the system is down. Their day-to-day activity involves information processing. Everything they do, they rely on the computers to at least give them that vital information.”

- The management team are able to undertake training of other management and staff on how to use the features of the application, as explained by the OM:

“...Basically, the way we operate, especially the management team, is that once we have figured out ... how to do a particular task on the system, we would share that information with the other persons who would need to use that particular report ... that particular facility ... as long as it will assist them in performing their day-to-day duties, we pass on the information.”

Table 5-16: Human IT Resources for Home Store

	Resource	Description/ Remarks
1	IT Technical Skills available from IT Department	The IT Department is responsible for providing implementation and technical support services to the Drugstore.
2	Ability to use available systems for day-to-day work	Home Store was heavily dependent on the IT system for all aspects of day-to-day operation.
3	Ability to conduct training internally	Management team able to undertake training for staff on how to make effective use of the system.

Source: Compiled by author

5.7.2.3 Complementary Organizational Resources

Specific non-IT attributes and skills that allowed Home Store to take advantage of the potential benefits offered by its IT systems were identified. These included a management structure that allowed Home Store to initiate requests for IT resources, and positive attitudes towards IT by management and staff. A summary of the Complementary Organizational Resources identified is shown in Table 5-17.

1. Availability of Funds to Acquire IT Tools

The OM indicated that the financial resources required to acquire IT tools were available, attributing this to the Directors seeing the benefit of having “strong IT”. He explained as follows:

“There hasn’t been any constraint as far as the financial resources are concerned, because the Directors saw the benefits of having a strong IT ...having strong IT in order for the business to be profitable. So there hasn’t really been a constraint in terms of financial resources in getting the tools that we need as far as IT is concerned.”

2. Supportive attitude of senior management

In responding to a question about the attitude of the senior management of the ABC Group towards IT, the OM categorized their attitude as being supportive and stated:

“They have come a long way, and they have now accepted the need for a proper IT system and they are now actually getting more involved and now have computers on their desks ... So they are now very open more open to it; and they realize that it’s an absolute necessity.”

3. Positive attitude to IT by Business Unit management

The OM characterized the attitude of the Home Store management as being “positive”. He attributed this partly to the relatively young age of the management team.

“I would say it’s all positive, because one of the things about Home Store is that the management team is very young, so they grew up out of the age of IT. It’s not a set of folks who had to learn it in the prime of their life. It’s a set of young people who, actually, while they were growing up IT was unfolding, and by all means, they have a very positive attitude.”

4. Positive attitude by Staff

The attitude of the non-management staff to IT was identified as “positive” by the OM.

5. Organizational Structure that allows BU to make equipment procurement decisions

Although there was a centralized IT Department responsible for procurement of IT equipment, the Home Store was able to initiate requests and obtain the equipment that it deemed necessary for its operations:

The structure really and truly allows us to make our decisions ... purchasing decisions ... there is no “open to buy” whereby we are restricted to certain amounts for certain departments. We can buy what we want as we see it

necessary in terms of product. Obviously, there is still protocol to follow when purchasing equipment, but once its requested, budgeted and approved, then, we can ahead and purchase what we need. As long as there is justification for it, there is no real hindrance in getting the necessary equipment.

Table 5-17: Complementary Organizational Resource for Home Store

	Resource	Description/ Remarks
1	Availability of funds to acquire IT tools	Funds were available to acquire IT tools as was deemed necessary and justified
2	Supportive attitude of senior management	Senior management were supportive of investment in IT
3	Positive attitude of business unit management	Attitude of Home Store management team towards IT was supportive
4	Positive attitude by staff	Staff were support of the use of IT
5	Organizational structure that allows Home Store to make equipment procurement decisions	Home Store was able to initiate requests for IT equipment and software it considered necessary

Source: Compiled by author

5.7.3 Contributions

The following were identified as contributions made by the firm’s IT to its competitive position. A summary of the contributions is shown in Table 5-18

1. Ability to sell goods from other branches

With the introduction of the INVENSYS SQL application, Home Store cashiers at any location were able to sell items available at any other location. This had made the firm more attractive to customers, as the OM explained:

“Of late we have made improvements to our point-of-sale system and that enabled one branch to sell goods out of another branch goods that are not at the branch. They are able to see the quantities and sell it if so desired, so that made them, again, even more attractive, in terms of shopping, as a destination.”

2. Better Purchasing

Home Store had been able to improve its purchasing by relying on purchasing recommendations produced by the system. This, according to the OM, had resulted in improvement in stock levels:

“It has actually allowed us to purchase much better and to keep our stock level at reasonable levels. We are very dependent on the system to do our buying. What the system tell us we should buy, is often what we go by.”

3. Better decision-making on products and pricing

The system provided capabilities that allowed Home Store managers to do various types of analysis of sales and inventory data, in order to make their decisions. The OM considered this to be an important benefit:

“The current system now allows us to better analyse our sales, so that we can determine ... we can make quicker decisions now, because of the capability of the system that we have, with regards to products not being sold at the right price, products not available at certain locations when they should be, products out of stock, products in stock, products that are not moving”

4. Speedier processing of Purchase Orders

Use of INVENSYS SQL has allowed Home Store to process its Purchase Orders more quickly, in turn speeding up the process of ordering of goods. The OM considered this to be an advantage:

“The new system now allows us to process a Purchase Order much faster and that we think is an advantage, compared to where we were before. Speedier processing of Purchase Orders ...”

5. Ability to offer wholesale prices

Introduction of INVENSYS SQL allowed Home Store to exploit a competitive opportunity in wholesaling that had previously been identified. Home Store had not been able to take advantage of that opportunity because management did not believe that the previous software package provided adequate controls to manage the operation. The OM explained as follows:

“One of our competitors was able to offer, and do a better job, at wholesaling than we were, and we were very much restricted by the last system, we had, in terms of being able to offer a true wholesale price and to monitor it as we would like. In the strategic planning, it was always identified that there was an opportunity, and the system prevented us from doing a better job at it. This current system that we have, now has all the capability to capture that ... to go after that opportunity and actually, as early as Monday, we are bringing on another salesman and we actually plot going ahead to use the system, and offer wholesale prices, and to close that gap that our competition has.”

6. More control over discounting

INVENSYS SQL allowed Home Store to exercise better control over discounts given to customers. This allowed Home Store to offer discounts in response to competitive pressures, but to more strictly control the amounts given. The OM explained as follows:

“I mentioned a situation about 2 years ago where we were faced with heavy discounting going on and we had to follow suit. Then again, the system that we had at the time was very limited and we end up giving away more than we would have liked, because of the limitations of that system, where, discounting is concerned. This system ... the current system, now allows us more control over discounting in that we can ... we can have a lot of different ... different options ... more control, so we don’t have to give away as much, because the system now affords us the opportunity ...”

The “more options” that the OM referred to included the ability to have customer-specific discounts for registered customers, and to vary the discount levels according to the customer category and the products purchased. For example, a customer categorized as a “plumbing contractor” might be given a 15% discount on plumbing products to encourage him to purchase his plumbing supplies from Home Store, but might only receive a 5% discount on other categories of products.

7. Daily information on sales and margins

In response to the question “What has been the greatest benefit of your IT implementation”, the OM responded: “Seeing what we’ve sold on a daily basis and being able to see the margins that you obtained.”

Table 5-18: List of Contributions for ABC Home Store

	Contribution	Description
1	Ability to sell goods from other branches	With the introduction of the INVENSYS SQL application, Home Store cashiers at any location were able to sell items available at any other location
2	Better purchasing	Home Store had been able to improve its purchasing by relying on purchasing recommendations produced by the system. This, according to the OM, had resulted in improvement in stock levels.
3	Better decision-making on products and pricing	The system providing capabilities that allowed Home Store managers to do various types of analysis of sales and inventory data, in order to make their decisions.
4	Speedier processing of Purchase Orders	Use of INVENSYS SQL has allowed Home Store to process its Purchase Orders more quickly, in turn speeding up the process of ordering of goods.
5	Ability to offer wholesale prices	Introduction of INVENSYS allowed Home Store to exploit a competitive opportunity in wholesaling that had previously been identified. Home Store had not been able to take advantage of that opportunity because management did not believe that the previous software package provided adequate controls to manage the operation.

	Contribution	Description
6	More control over discounting	INVENSYS allowed Home Store to exercise better control over discounts given to customers. This allowed Home Store to offer discounts in response to competitive pressures, but to more strictly control the amounts given
7	Daily information on sales and margins	In response to the question “What has been the greatest benefit of your IT implementation”, the OM responded: “Seeing what we’ve sold on a daily basis and being able to see the margins that you obtained.”

Source: Compiled by author

5.7.4 Inhibitors

The following factors were identified from the interviews and other data as inhibiting the extent to which the firm’s IT contributed to achieving or improving competitiveness. A summary of the inhibitors identified for Home Store is shown in Table 5-19.

1. Slow Customer Checkout Speed

The length of time required to process a customer at the checkout was considered too long by both Home Store and its customers. The slow speed at times led to long queues. The OM described the problem as a “stumbling block”:

“That has been a stumbling block for us, in terms of how quickly we can get the customer in and out ... whether it is through scanning or otherwise...”

The GM also stated:

“I think the system is deficient when it comes to checkout. The checkout is too slow. Because of that customers have to wait around.”

Two factors identified as contributing to the slow speed (a) the absence of barcodes on some items, making it necessary for the cashier to key in an item code or description rather than scanning the item and (b) the need to execute the firm’s procedures for verification of payment if the form of payment was not cash. According to the GM:

“I think a lot of the speed, the slowness if you want to say, of the actual transaction process, is probably more procedure wise, with regards to checks. Are the barcodes in the system? Are the items scanning? I think our procedures are probably quite cumbersome to protect ourselves financially and a lot of that is probably being quite detrimental to the slowness of the process, now rather than the IT and computer issues themselves.”

While the level of scanning had been improving, the payment procedure continued to cause delays, as explained by the OM:

“The cashiers are scanning a lot now but with regards to their... I think it’s actually ... it more has to do with the method of payment is not cash.”

The procedures required that customers paying by cheque or credit card provide identification, address and telephone number, which had to be entered into INVENSYS SQL. Customers who had accounts with the company had to provide a purchase order. The reference to the purchase order had to be entered into the system. The firm did this to allow it to recover payment in case the payment was not honoured. The OM explained:

“The way we are using the technology and the way businesses are operating now, in terms of trying to protect themselves from fraud and what have you, in that they are putting all these other steps and procedures to safeguard themselves. I think that in itself is contributing to ... adding, additional steps, to the process. ... What happens at the checkout, there is almost the screening of the customer, and customers do take offence. - why are you asking me all those questions? And what have you.”

The fact that INVENSYS SQL did not directly support some of the procedures used by Home Store also contributed to the slow checkout speed. The IT support officer identified 2 such instances. One occurred when a return was done and the cashier needed to write additional details after the invoice was printed:

“One thing that contributes to the slowness is the number of things the cashiers have to write on the invoices, so for example if it’s a return ... a charge customer does a return, after the invoice is printed they would have to write down the reference number of the original ticket on that new invoice. That also happens if it’s a store credit is being issued. We’ve been making changes actually to correct that, so right now a validation screen comes up and the cashier would actually key in the ticket number ... the original ticket number and that would then be printed on the invoice. And we’re also working on having the same thing happening for the store credits”.

Another instance was the payment for goods to be collected from another location. INVENSYS SQL did not provide the means to indicate which items were to be collected, so the cashier had to write this information after the invoice was printed:

“The other thing making it slow - if customers are picking up items from two locations, the cashiers cross off what exactly they are picking in the front and to basically, denote, which ones are being picked up from the back [warehouse].”

2. Delays in making goods available for sale

Delays in processing of imported goods received caused delays in making the goods available for sale. This in turn caused customer dissatisfaction and caused the company to lose revenue opportunities, as the GM explained:

“Customers can’t believe sometimes when they see items in the warehouse, and yet they can’t touch them. Because the receiving process is so long and it frustrates them to hell. They see items there and if it’s physically there, why can’t I buy it? Why do I have to wait for it to get into the system? We have to get it into the system quicker. There’s nothing worse than a person who has money in his pocket ... to tell him “I’m terribly sorry you can’t buy it”. You don’t know what that could cost us.”

Prior to being added to the inventory database and made available for sale, the *landed cost* of imported goods has to be calculated by processing the receipts through a Customs Brokerage system. During this step, the amount of duties and taxes payable to the government is calculated. After this process was completed, the data was exported from the Customs Brokerage system to INVENSYS SQL, where the management had to review the cost and set the price prior to making the items available for sale. The process sometimes required several iterations because of errors made during the process.

The OM indicated that Home Store’s slow receiving process put it at a competitive disadvantage to one of its major competitors:

“They are able to receive their goods on the system much quicker than we are, in that ... basically they are just waiting for the goods to start selling them. There is not much work to be done after the goods are cleared and off the docks. I think that gives them a real advantage over us because we have our bottlenecks to deal with.”

Both the computer input required and the manual procedures involved in the receiving contributed to the delays. The IT Support Officer outlined the procedure as follows:

“With the current system it does take a length of time to actually process the items or a least, for the customs brokers to enter those items and classify those items firstly, enter those items and then go through the ASYCUDA program [the government’s online customs approval program] to get them taxed and that sort of thing. ... Once that has been done, it also takes a little while until the GRN [Goods Received Note – an internal document] can be given to the receivers because they don’t actually receive the items until they get the GRN from the warehouse. Even after the goods have being accepted by customs and the goods have been cleared at the warehouse point, it does take a while as well for the GRN to get to the receivers. They would need to physically examine those goods against the invoices and then pass the GRN for receiving, so that part takes a little while as well.”

The management of Home Store acknowledged that their procedures were a significant contributor to the delays. They were of the view however, that better IT could lead towards a reduction. The OM believed for example, that using scanners at the receiving point would reduce the manual work and time required for verification of receipts. He explained:

“There is still too much reliance on paperwork. For instance, once the goods come in, if we use scanners, there is a verification process that occurs. That’s

in the goods that we have already. We can even take it a step before ... so once the invoices became available ... getting that information into the system even before the goods get here, so when they get here, you can use scanners to do the verification. Once it's verified you upload. Price is verified and prices go in ...UPCs go in. We are still doing all these other steps thereafter, and that is slowing down the process from getting the goods onto the retail floor.”

The GM also believed that a combination of factors including procedures and errors contributed to the delay:

“Procedures again playing a big part of that. I think staff playing a big part of that. Paperwork getting stuck on certain desks, whether it is Receiving clerks, buyers, customs brokers. I think the process has speeded up some, but I still find it cumbersome. Where the bottle neck is currently, I cannot really tell you. It seems to be a combination of errors.”

The company had requested that the IT Department assist in reducing the time taken to process the receipt of goods. The IT Department had listed this as a priority activity to be undertaken during the 2006/2007 financial year. The Department's workplan for Home Store included an entry for “Customs Operation Refinement” which stated as its objective:

“Reduce time wastage in generating customs entries and other Customs activities. Ensure goods are priced and available for shelving in the shortest possible time.” (Source: IT Department 2006/2007 Workplan for Home Store. Provided by IT Department).

3. Slow system performance

Some technical problems encountered in the use of INVENSYS SQL caused the system performance to slow. This also contributed to the problem of slow checkout speed. Occasionally the system would become very slow or even “freeze” (hang), as explained by the Sales Manager:

“INVENSYS freezes. Now it's untimely. Well at first, when we started monitoring it, it used to be whenever there is a reconciliation going on, but then it started happening “ad hocly” lately. But it would still happen.”

This had proven very disruptive to the checkout process. In such cases, the company had to resort to a manual checkout process while the problem was being resolved. One of the consequences was that some customers would abandon their purchases, as the Sales Manager explained:

“You have customers standing on a line because ... After they wait a while, they have to continue waiting. We get out the books to write, or sometimes we have to restart. It's a big inconvenience for them. Some customers will walk away. Obviously that's a loss for us. “

A review of notes prepared by the IT Department after meetings with Home Store management showed that system performance problems had been identified as contributing to the “slow checkout” problem identified above. For example, the minutes of one meeting contained a decision that the IT support officer should “research SQL Server database performance tools and perform database maintenance” and “monitor network traffic to determine the cause of slow performance at certain times of the day”. (Source: Minutes of meeting between IT Department and Home Store – 26 April 2006. Minutes prepared by IT Department).

It had subsequently been determined that a major contributor to these problems was that the server was overloaded. The IT support officer explained the nature of the problem and the actions that had been taken to resolve them:

“There’s one server currently housing all applications. That server is also the domain controller and contains Active Directory and so on, so it has to authenticate users, etc. The machine also runs client backups as well as tape backups. The tape backups, I have noticed of recent ... the tape back ups were ending at 7:00 to 7:15 am so I started the back ups earlier. The tape back ups are now ending at 6:00 to 6:15 am. The memory on the server as well - we increased the memory by two gigs and we’ve seen... it is a little faster possibly but it is more reliable so they don’t have that many ... like posting errors, replication errors, as they did before.”

Adjusting the timing of the server backup and increasing the server’s memory had led to some improvement but the problem still existed.

4. Not making use of available system features

Home Store was not using some of the available features of the INVENSYS SQL system, and managers believed that as a result the company was not deriving potential competitive advantages. The OM explained as follows:

“There are parts of the system we are not using. There are features of the system we are not using and it’s not that we don’t want to use them but we are still probably struggling to get a firm grip on the basic parts of the system. Until we find that we have fully understood or we have a good grasp of the basics of the system ... we have not explored the additional features that the system has. INVENSYS has something with regard to orders, and I know and I’m sure it’s something we should be using. We haven’t had the time, we are preoccupied with other things, with what we are using and trying to make sure that we are fully utilizing it to its full capability, but there are other features on the system there that we haven’t even explored, they could make our life a lot simpler.”

Specific examples cited by the OM were features for maintaining images of items available for sale, and use of a Customer Loyalty programme:

“ I know that the system, right now, it can allow you to have picture of the items that you have in stock, and make it available to your customers ... we

are not using that ... that would be a good thing to have. The whole loyalty programme, is something that we would like to use, but are not yet using it, and we think that would give us a competitive advantage.”

The GM gave as an example, the use of the advanced pricing capabilities of the software.

“I think the pricing capabilities are very big, the potential is there but we don’t know how to use it properly. We haven’t taken full advantage of that.”

The pricing features available in the software could allow the company to use special pricing arrangements as a marketing tool. For example, it supported the use of various types of promotional pricing as well as special discounts for selected categories of customers.

5. Inadequate Staff Training

Management believed that the staff, particularly those on the sales floor, were not being given adequate training in the use of the software. The GM emphasized this by stating:

“I think one place we are lacking big time is training in IT for staff on the sales floor. I think the staff could do with a lot more training in order to use the system to... and I don’t think that’s working at the moment.”

He attributed that to management and supervisors for not providing adequate training to the general staff body:

“Maybe management haven’t given it enough attention. I think basically they expect the staff to train themselves. We train the supervisors, and I don’t think the supervisors are spending the time with the staff, especially the new staff on board. They should be giving them a lot more time and teaching them how to use the system. So we have trained the supervisors, but I don’t think the supervisors are passing that information down.”

He gave an example of the failure to move inventory among locations, as an example of a problem caused by this lack of training and lack of understanding of the system:

“I think there are too many items at other locations ... maybe they don’t know how to do it ... we’re not getting it from one location to another. ... So we have an item at one location and not spread out through the other locations. To see whether items are on order ... to see when items are expected to be coming in ... I think sometimes the lookup is too complicated. When you have items that are very similar in nature and description, sometimes you find that it is difficult to look up the items and give the customer the right information. I think basically, not being able to zoom and order from different locations is our main hindrance.”

The managers conceded that the lack of a proper training plan contributed to the inadequacy of the training provided to staff. The OM outlined a typical training scenario for a new employee:

“There is not a proper training plan in place for a new inventory person or a new cashier. There would come and sit next to another cashier and watch what he or she is doing or sit next to inventory person and watch what he or she is doing, ask questions and learn the process. Now obviously, seasoned persons teaching another one, there would be shortcuts they would take, there would be steps that they would miss out and what have you, so you find that this person would only get really and truly up to speed after a year or two, after having gone and made the mistakes themselves.”

The pressures of the business and the need to have employees working as quickly as possible also contributed, as explained by the OM:

“When the staff come on board you really need them to hit the ground running and you are not making the time to ... you don't have a reserve. When you have a vacancy it's because you need that body in the place. You don't have the time to say well Ok! Well they're going to go through training and even if it's not on the live system - somewhere else - before they get up to speed and they're put in the firing line.”

The company had realized the deficiency in its approach to training and had made plans to address that, as explained by the GM:

“A lot of it is staff teaching themselves, supervisors teaching staff, management teaching supervisors. It was identified in our Strategic Plan that is definitely a major problem, and myself and the Operations Manager, have been given the task for the next twelve months, to make sure we adequately train and do regular training of all staff for all levels on the INVENSYS SQL system. It was identified, it is still a problem, and I think it's still can cost us a lot in time, money efficiency and sales.”

6. Insufficient assistance from IT Department to increase system use

The Home Store managers were not receiving the amount of assistance they hoped to get from the IT Department in order to identify additional benefits they could derive from the existing system. The OM stated:

“We depend on the IT department tell us but hey! This problem you are having - it actually can be solved by using Orders on the system or using X, Y Z. And then the system itself is being constantly updated and improved, so you can never catch up with fully utilizing it, especially this particular program, what it has to offer”

The managers believe that the system would better serve Home Store's needs if the IT Department provided the requested assistance. For example, in an e-mail to the IT

Manager, the OM requested that the IT Department propose a solution to improve the replenishment of sales floor inventory from the warehouse:

“I would like to see a system using INVENSYS that enables us to do a better job of ordering from the warehouse. At present the sales clerks do the orders. However I am certain that a number of items are not making it to the sales floor in a timely manner and more so some items never make it to the sales floor. The "item list and quantity on hand report" although quite good, is still somewhat inadequate. I would like to see a system that replenishes the retail floor / outlets with items based on what is sold and it's availability in the warehouse. (Source: E-mail from OM to IT Manager – 7 Feb 2006)”

In the GM's view, the IT Department should provide more training to Home Store on how to take greater advantage of INVENSYS SQL's features:

“I think the IT Department can probably do a better job training us, telling us what the system can do. I am sure there are a lot more areas that we don't even have time to look at. Hopefully IT can say “what more are you looking at from the system, what more reports do you want?” There are so many different things I'm sure you can do, it should be nice if IT had more time, and then to work with us, to train us, to say “By the way the system can do A,B and C”. I think, IT falls short in doing that but obviously we should be teaching ourselves but you can teach yourselves up to a certain limit. That probably is a short fall.”

The IT Officer acknowledged that the IT Department was not doing enough to advise on additional capabilities of the existing system. This was attributed to time limitations:

“Overwork. insufficient IT staff . I guess when an upgrade comes out, we probably should look at it as IT staff - look at it and then report to them on how we see each new or improved feature can assist them. We don't really have the time to go in depth with that. Well what I will do is actually just browse through it and send a copy to them to look at but seems as if nobody has the time ... We don't really sit and take a comprehensive look at the product and see, how best we can use it to streamline things or incorporate a certain feature into our procedures, or change procedures to make things better, but we just don't.”

Table 5-19: List of Inhibitors for ABC Home Store

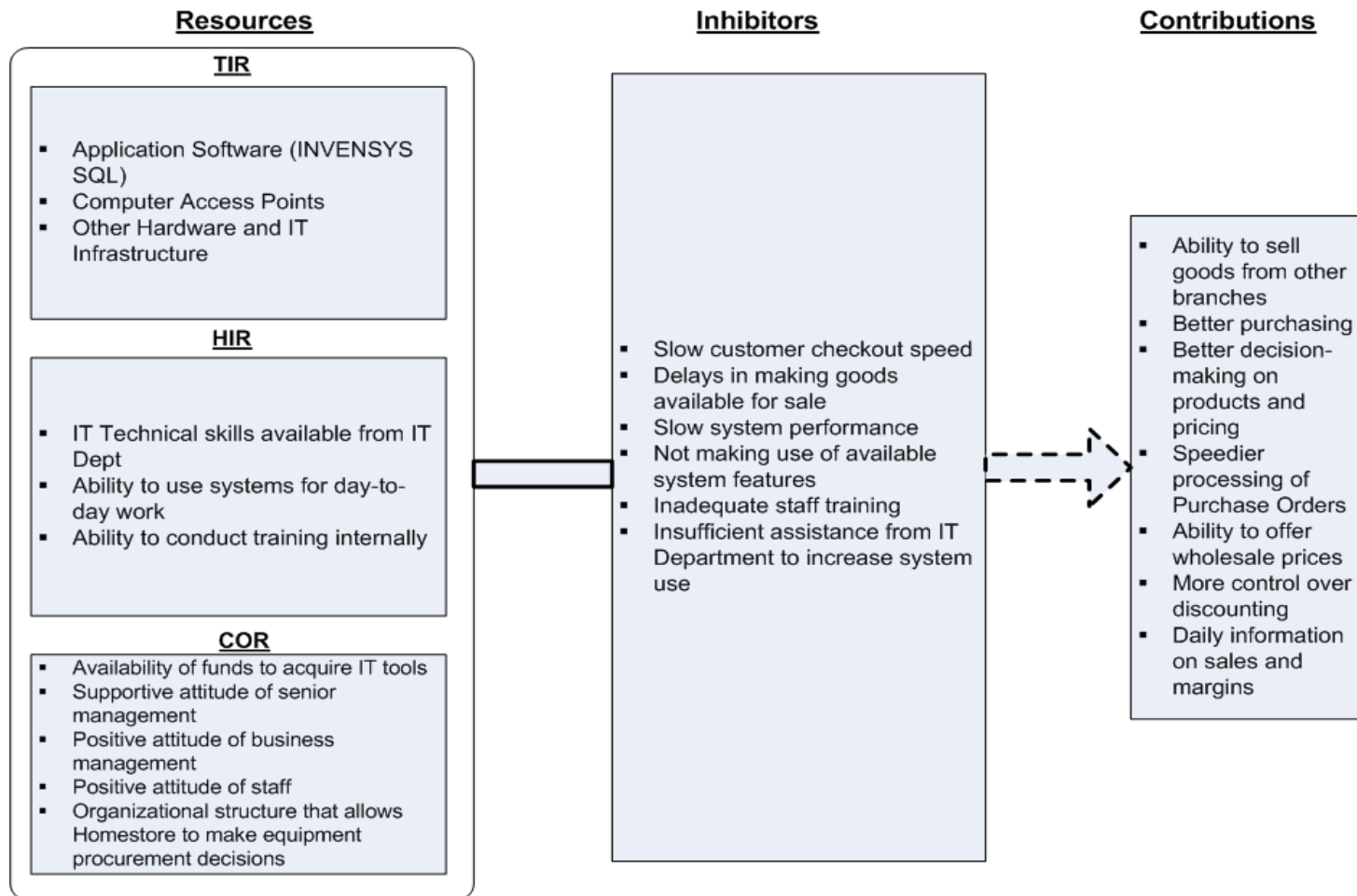
	Inhibitor	Description
1	Slow customer checkout speed	Slow speed at checkout caused customers to be “waiting around” at the checkout and caused dissatisfaction. A number of factors, including system performance problems and internal procedures, contributed to this.
2	Delays in making goods available for sale	Delays in the processing of receipt of goods, including calculation of Landed Cost and setting of prices, led to delays in making goods available for sale. This caused customer dissatisfaction and caused the company to lose revenue opportunities.
3	Slow system performance	Some technical problems encountered in the use of INVENSYS SQL caused the system performance to slow. This also contributed to the problem of slow checkout speed.
4	Not making use of available system features	Home Store was not using some of the available features of the INVENSYS SQL system, and managers believed that as a result the company was not deriving potential competitive advantages.
5	Inadequate staff training	Staff did not receive adequate training in the use of the software, and this contributed to inadequate use. While training was provided to the supervisors, this was not passed on adequately.
6	Insufficient assistance from IT Department to increase system use	The Home Store managers were not receiving the amount of assistance they hoped to get from the IT Department in order to identify additional benefits they could derive from the existing system.

Source: Compiled by author

5.7.5 Summary of Resources, Inhibitors and Contributions

Figure 5-5 below shows the summary of Resources, Inhibitors and Contributions identified for Home Store, as described in the Sections 5.7.2 – 5.7.4 above. The diagram was derived by populating the conceptual model described in Section 5.4.3, with the lists of Resources, Inhibitors and Contributions shown in Tables 5-15 to 5-19.

Figure 5.5 shows that the combination of resources leads to the contributions to competitiveness identified in Section 5.7.3. The broken arrow signifies that the value of the potential contribution is reduced by the inhibitors identified in Section 5.7.4



Home Store

Figure 5-5: Summary of Resources, Inhibitors and Contributions for Home Store (Compiled by author)

5.7.6 Case Analysis and Discussion

5.7.6.1 Analysis of Inhibitors

Table 5-20 describes the cause and effect relationships among the inhibitors derived from the analysis of the data, as discussed in Sections 3.5.3.2 and 5.3.5. Figure 5-6 shows the causal network derived from the data, also described in Sections 3.5.3.2 and 5.3.5. The causal network provides graphical representation of the relationships contained in Table 5-20.

Table 5-21 shows the list of *inhibiting factors* identified in Table 5-20 and Figure 5-6, and the number of times each one is involved in “To” and “From” relationships, as discussed in Section 5.3.5. Table 5-21 also shows the shortened “node names” used for each of the factors on the causal network to ensure greater readability of the network.

A total of 22 relationships (Table 5-20) among 23 inhibiting factors (Table 5-21) identified from analysis of the inhibitors is described in Section 5.7.4. From Table 5-21, it can be seen that of the 23 inhibiting factors, 5 have a total connection count of 3 or greater, while 4 have a connection count of 2 and 14 have a connection count of 1. This suggests that those with connection counts of 3 or more may be of greatest significance (Tague, 1995).

The nodes with connection counts of 3 or more are listed below, with the number of connections shown in brackets.

- Delays in making goods available for sale (4)
- Inadequate staff training (4)
- Not using available features (4)
- Slow customer checkout speed (7)
- Slow receiving process(3)

Five factors contribute to *slow customer checkout speed*, which emerged prominently from the analysis. The slow checkout speed contributes to a loss of sales and to customer dissatisfaction. While the management of Home Store acknowledged that internal procedures, particularly with regard to payment verification were largely to blame for the slow checkout speed, the inability of the INVENSYS-SQL software to support these procedures was also an inhibiting factor.

The *delays in making goods available for sale*, which was due to a *slow receiving process*, was also a significant inhibiting factor that contributed to loss of sales and customer dissatisfaction. Like the slow customer checkout speed, the receiving process was slow due to a combination of internal procedures (cumbersome receiving procedures) and the inability of the software to support the procedures that Home Store had implemented.

A significant concern for Home Store was that the company was not using features available in the software and consequently not deriving benefits that it could have. The inadequacies of training contributed to this underutilization, as did the lack of assistance from the IT Department. Home Store's management considered it to be the IT Department's responsibility to advise on the use of additional features available in the software from which Home Store could derive benefits.

The relationships identified in Table 5-20, form 2 separate clusters of nodes in Figure 5-6, containing 14 and 9 nodes respectively. None of the nodes in any of these clusters contains a link to a node in any other cluster, signifying that the data did not show any such connection.

5.7.6.2 Case Discussion

The competitive strategy described by Home Store management was based around being a "one-stop shop" for customers – offering customers the opportunity to obtain as much of their requirements as possible from a single location. In that regard the firm aimed to offer a wider range of products than its competitors, more inventory and more choices of locations from which to shop. Further, Home Store offered customers visiting any of its branches, the ability to make purchases of items available at any of its other branches, an ability that was facilitated by its IT system.

Home Store management were able to identify several contributions that IT made to the competitiveness. Two of these were as a direct result of the IT system:

- (a) The ability to sell goods from other branches
- (b) The ability to pursue the wholesaling opportunity, which the firm was previously unable to do.

Most of the other contributions to competitiveness were through provision of information to support better decision-making, particularly with regard to purchasing. The use of IT also assisted in improving control of discounting, thereby reducing potential revenue losses.

The data shows that Home Store had been able to derive significant competitive benefits from its IT resources. While the computers and software that the business possessed were "off-the-shelf" products that are widely available, Home Store had been able to combine these with other resources to derive the contributions. The WAN infrastructure allowed replication of data among the branches over relatively short intervals, making it possible for branches to access each other's inventory data for sales.

Home Store had a strong set of Complementary Organizational Resources that allowed it to derive greater benefits from the available IT. In particular there was evidence of, strong support for and positive attitude towards IT by senior management, business unit management and the rest of the staff. Further, the business

unit management were willing and able to invest in IT tools as they saw fit, and were allowed to make IT procurement decisions.

Of the 7 contributions identified for Home Store, however, 4 of them are undermined by the inhibiting factors identified. These are:

- Ability to sell goods from other branches
- Better purchasing
- Better decision-making on products and pricing
- Speedier processing of Purchase Orders

The ability to sell from other branches is reduced by the fact that the software does not provide adequate support for deliveries from other locations – thus the *Inadequate support for delivery* inhibiting factor reduces the value of the INVENSYS SQL resource in that regard.. Processing transactions requiring delivery from other locations contributed to slow checkout speed procedures.

The benefits from better purchasing, better decision-making on products and pricing and speedier processing of purchase orders were all reduced by the delays in making goods available for sale, which resulted from losses in the potential revenue from selling these goods. These delays arose because inhibitors such as *Insufficient assistance from the IT Department to increase system use* and *Not making use of available system features* reduced the extent of the combination between Home Store's COR and the available TIR.

Notwithstanding the weaknesses cited above, the contributions that Home Store has derived from IT have been from using its CORs and HIRs to leverage its TIR towards the competitive strategy of being a “one-stop shop”. While the TIRs identified are easily imitable, the existence of a strong set of CORs give Home Store the ability to create combinations that are likely to be rare, difficult to imitate and difficult to substitute and therefore be a source of sustainable competitive advantage.

Table 5-20 – Cause and Effect relationships for Drugstore inhibitors

	Causes	Effects	Description / Remarks
1	Slow customer checkout speed	Customer dissatisfaction	The slow checkout process meant that customers had to “wait around” leading to dissatisfaction.
2	Slow customer checkout speed	Loss of sales opportunities	In some instances customers abandoned their purchases because of the slow checkout process.
3	Internal procedures to verify customer payment	Slow customer checkout speed	The company’s procedures for verifying “non-cash” payment, particularly with regard to capturing customer identification information, slowed down the checkout process.
4	Items without barcodes	Slow customer checkout speed	When items were sold without barcodes, the item number or description had to be keyed in, which took longer than if the item could have been scanned.
5	Inadequate system support for payment verification procedures	Slow customer checkout speed	Cashiers needed to write in additional information required for payment verification, thereby slowing down the process
6	Inadequate system support for delivery from other locations	Slow customer checkout speed	Cashiers needed to write instructions for delivery from other locations since system did not have a feature to print those instructions. This slowed down the checkout process.
7	Slow system performance	Slow customer checkout speed	Slow performance was identified by the IT Department as contributing to the slow checkout speed.
8	Slow receiving process	Delays in making goods available for sale	Goods could not be made available for sale until the receiving process had been completed and the received inventory updated in INVENSYS SQL
9	Delays in making goods available for sale	Customer dissatisfaction	Customers became frustrated when they were not allowed to purchase goods that were in the warehouse but not yet available for sale because of the slow receiving process.

	Causes	Effects	Description / Remarks
10	Delays in making goods available for sale	Loss of sales opportunities	The company lost sales opportunities because goods physically available could not be sold until the receiving process was completed.
11	Delays in making goods available for sale	Competitive disadvantage	The company was at a disadvantage to one of its major competitors because the competitor could make goods available for sale much more quickly
12	Slow landed cost calculation process	Slow receiving process	The lengthy process for doing the landed cost calculation contributed to the slow receiving process.
13	Cumbersome manual receiving procedures	Slow receiving process	The cumbersome manual procedures that required physical inspection and recording of goods received contributed to the slow receiving process
14	Overloaded server	Slow system performance	The fact that the server was being used for several purposes slowed down the operation of the system.
15	Not using available features	Not deriving some potential benefits from the available systems	Home Store was not deriving some of the benefits sought because the features providing those benefits were not being adequately used.
16	Inadequate staff training	Not using available features	A consequence of the inadequacy of training provided to staff was that they were not aware of some of the system's features and how to use them.
17	Preoccupation with current uses	Not using available features	The company was preoccupied with fully mastering the current uses of the system and had not devoted sufficient time to learning about the new features.
18	Insufficient management time devoted to staff training	Inadequate staff training	The management, who had undertaken the responsibility of training staff in the use of INVENSYS SQL, did not devote enough time to this undertaking.
19	No training plan	Inadequate staff training	Home Store did not have a training plan to guide the provision of staff training and this contributed to the inadequacy.

	Causes	Effects	Description / Remarks
20	Pressures of business	Inadequate staff training	Due to pressures to put new staff to work as soon as possible, the amount of training provided to new staff was not adequate
21	Insufficient assistance from IT Department to improve system use	Not using available features	Home Store management depended on the IT Department to provide guidance on how features available in the software could be used. The IT Department was not providing this assistance to the extent required.
22	IT Department unable to allocate required time	Insufficient assistance from IT Department to improve system use	The IT Department were not able to allocate the time required to provide the assistance to Home Store

Source: Compiled by author

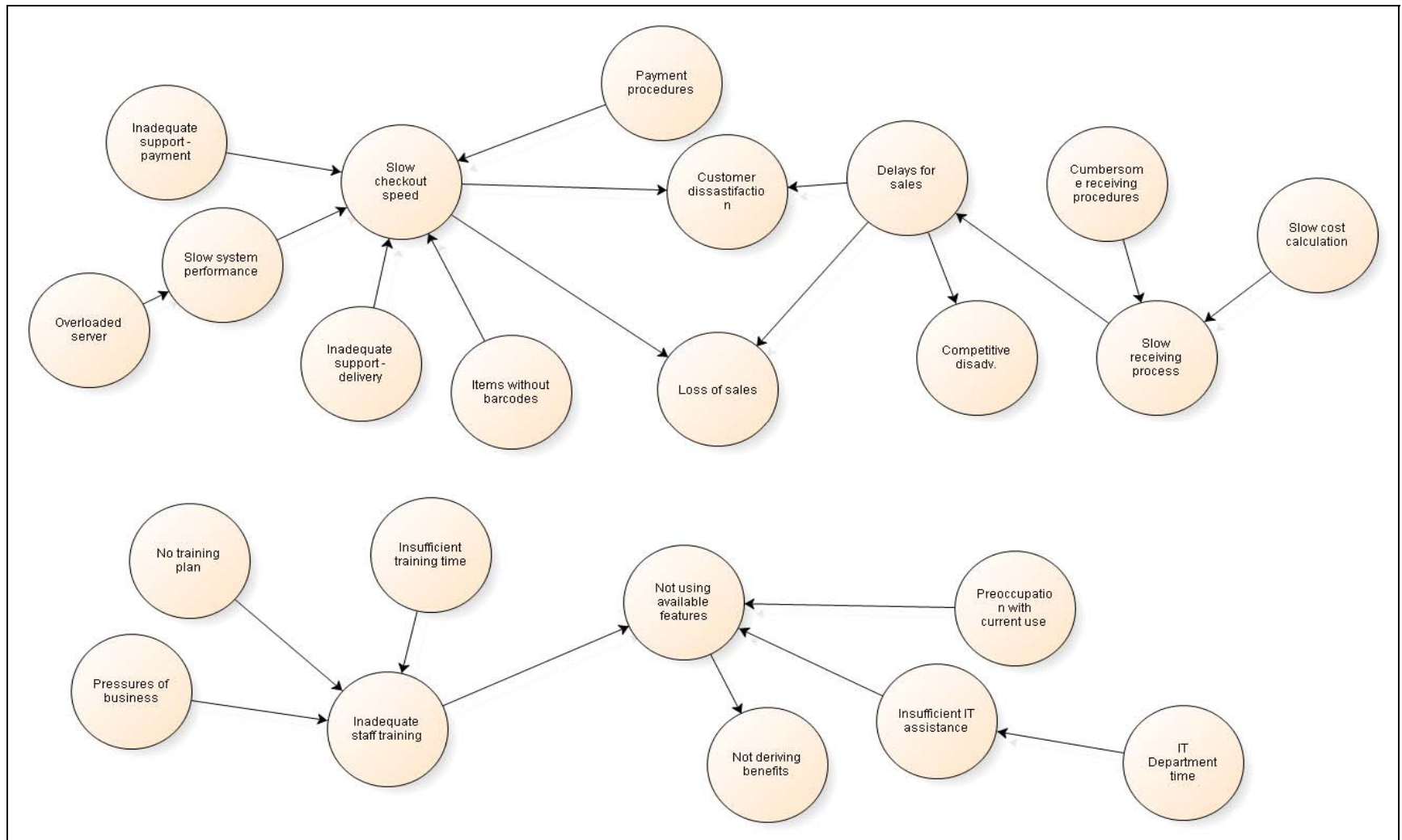


Fig 5-6 Causal Network for Home Store (Source: Compiled by author)

Table 5-21 List of Inhibiting Factors for Home Store

	Inhibiting Factor	Node Name (used in Causal Network)	Connection Count		
			TO	FROM	TOTAL
1	Competitive disadvantage	Competitive disadvantage	1	0	1
2	Cumbersome manual receiving procedures	Cumbersome receiving procedures	0	1	1
3	Customer dissatisfaction	Customer dissatisfaction	2	0	2
4	Delays in making goods available for sale	Delays for sales	1	3	4
5	Inadequate staff training	Inadequate staff training	3	1	4
6	Inadequate system support for delivery from other locations	Inadequate support - delivery	0	1	1
7	Inadequate system support for payment verification procedures	Inadequate support - payment	0	1	1
8	Insufficient assistance from IT Department to improve system use	Insufficient IT assistance	1	1	2
9	Insufficient management time devoted to staff training	Insufficient training time	0	1	1
10	Internal procedures to verify customer payment	Payment procedures	0	1	1
11	IT Department unable to allocate required time	IT Department time	0	1	1
12	Items without barcodes	Items without barcodes	0	1	1
13	Loss of sales opportunities	Loss of sales	2		2
14	No training plan	No training plan	0	1	1
15	Not deriving some potential benefits from the available systems	Not deriving benefits	1	0	1
16	Not using available features	Not using features	3	1	4
17	Overloaded server	Overloaded server	0	1	1
18	Preoccupation with current uses	Preoccupation with current use	0	1	1
19	Pressures of business	Pressures of business	0	1	1
20	Slow customer checkout speed	Slow checkout speed	5	2	7
21	Slow landed cost calculation process	Slow cost calculation	0	1	1
22	Slow receiving process	Slow receiving process	2	1	3

	Inhibiting Factor	Node Name (used in Causal Network)	Connection Count		
			TO	FROM	TOTAL
23	Slow system performance	Slow system performance	1	1	2

Source: Compiled by author

5.8 Case 3 – ABC General Insurance

5.8.1 Case Overview

5.8.1.1 Background

ABC General Insurance Company (ABCGI) began operating in October 2004. This however, represented an evolution from its prior operation as an Insurance Agency, rather than the commencement of a new business. Prior to that, the ABC Group of Companies had been involved in the Insurance business for “over 100 years”, according to the company’s website. The major difference between the two operations is that while the Insurance *Agency* contracted insurance risks on behalf of a *Principal* in return for a commission on the premiums earned, the Insurance *Company* accepts the risk itself and earns the premium. Also, in the Agency-Principal relationship, the Principal was responsible for the payment of claims, while in the case of the Insurance Company, the company is responsible for the payment of claims.

Most of the existing management and staff of the insurance business were retained in the transition from Insurance Agency to Insurance Company. Also, the arrangements for management and support of IT by the Group IT Department were retained.

The company’s brochure promotes it as being dependable, “strongly capitalized”, having good re-insurance arrangements and offering good customer service. Day-to-day management of ABCGI is the responsibility of the General Manager, who is supported by an Assistant Manager.

ABCGI is managed by a General Manager (GM), who reports to ABCGI’s Board of Directors. The Board of Directors includes the CEO and the Group Financial Director of ABCGI, both of whom were interviewed. The second most senior manager within the ABCGI business unit is the Assistant Manager (AM). The GM had been with ABCGI, in the position of GM, for approximately 15 years at the time of the interviews. The AM had also been with ABCGI for approximately 15 years, but had been in the position of AM for approximately 5 years. Interviews were conducted with the GM and AM, as well as with the Underwriting Supervisor and the Accountant.

During the time the research was being conducted, the IT Manager also prepared an assessment of the core IT application – a software package referred to here as INSURSYS. This was done because of complaints of dissatisfaction from managers at the business unit and at the Board of Directors level, as well as from users with ABCGI. The INSURSYS application had been purchased from a UK-based vendor as ABCGI has been unable to source what it considered to be a suitable product from a Caribbean-based vendor. The product was also well established in the UK Insurance industry. The assessment report, completed in December 2006, was subsequently made available for this study.

5.8.1.2 Competitive Environment

The managers perceived the main source of competition to be other “general insurance” (i.e. “non-life” insurance) firms operating in the local market and offering similar insurance services. The GM cited figures from the Registrar of Insurance as showing that there were currently 23 general insurance firms in the local market. He stated however, that according to the annual returns that these firms were required to submit to the Registrar of Insurance, 4 of those firms, (including ABCGI), accounted for over 70% of the total premium income.

The managers were undecided however, as to whether or not insurance brokers operating in the local market represented competition. These firms act on behalf of customers requiring insurance and seek to find the insurer best able to meet the customers’ needs at the best price. The insurer pays the broker a commission for every policy placed, and as such, gets a lower net premium than if the business was transacted directly with the customer. The fact that the broker may direct prospective customers to other insurers and also appropriates some of the income that the insurer could potentially earn means that the broker could be a competitor. On the other hand, brokers can also bring business that the insurer would not otherwise receive.

Emergence of the brokers as a major factor in the local insurance was identified by the interviewees as the most significant change in the competitive environment in recent times. To illustrate this, the GM quoted internal figures that showed that during October 2004, ABCGI’s transactions with insurance brokers accounted for approximately 28% of its total number of transactions for that month, but accounted for approximately 48% of its revenue. In general, the GM was of the view that the company would continue to do business with brokers, since increasingly the trend was for customers to go to brokers instead of directly to the insurers.

For many of the local insurers, the main basis of competition was price. ABC General Insurance management conceded that to a large extent the products available from competitors in the market were similar, and that customers tended to choose the cheapest, or choose a company based on the image of that company and prior relationships.

5.8.1.3 Competitive Position and Response

The company’s response to the increase in competition in the local insurance market and particularly to the intense price competition has been to promote its image as a dependable and well-established insurer. It aims to attract and retain relatively low-risk clients, who are willing to pay higher premiums for the comfort of knowing that the company has a good track record on the payment of claims. Through this strategy it expects to have a much higher *Premium Income to Claims ratio* than its competitors. It is also of the view that some of the competitive strategies of the competitors, based on low prices, are unsustainable.

The company is one of the largest and best known insurers in the local market. As noted earlier, it is also among the 4 companies that the GM identified as controlling over 70% of the share of premiums in the local market.

Given the increasing influence of insurance brokers in the local market, the company is also aiming to make its service more attractive to brokers. One of the perceived requirements for competing for business from brokers is to provide a quick response – whether in responding to a request for a quotation or issuing policy documentation after a transaction has been completed. The company expects that its recent investment in an improved Insurance Underwriting system will allow it to respond more quickly.

The GM stated that ABCGI does not have a formally documented strategy. However, there are strategies that have been discussed and approved at the Board level. According to the GM, the decision to move from an Agency to a Company operation was one such strategic decision.

5.8.2 Resources

5.8.2.1 Technical IT Resources

The Technical IT Resources identified by the study are described below. Table 5-22 shows a summary of the Technical IT Resources.

1. Application Software

The main application used by ABCGI to support its business is an Insurance Underwriting package referred to in this document as *INSURSYS*. This application provides features and functionality to support most aspects of ABCGI's business and includes functions for the following:

- *Business Partner Maintenance* - maintains details of Customers, Brokers, Banks, and other entities that the company does business with.
- *Policy Quotes* – generates quotations for current and prospective customers
- *Policy Generation* – captures and records all details required for each policy
- *Policy Endorsements* – allows changes to be effected to existing policies
- *Policy Document Generations* – prepares documentation related to policies. This includes Cover Notes, Policy Documents, Endorsements, etc.
- *Policy Renewals* – renews expired or expiring policies
- *Preparation of Statement of Accounts for brokers*
- *Claim Processing* – captures and records details related to each claim application as well as the results of the claim application
- *Reinsurance* – associates different types of policies with the applicable reinsurance agreements and allocates premium income and claim liabilities to reinsurers according to the terms of the agreement.
- *Report Generation* – preparation of transactional and analytical reports/

2. Computer Hardware and Infrastructure

The computer hardware and infrastructure available to ABCGI is used primarily to support the operation of the INSURSYS application. The following are available:

- A server computer which functions as a central repository for all data for the INSURSYS system
- 12 PC workstations used by staff
- 4 laser printers used for printing documents and reports
- A Local Area Network (LAN) that connects the workstations to the server and allows all the workstations to access the INSURSYS application.

Table 5-22: Summary of Technical IT Resources for ABCGI

	Resource	Description/ Remarks
1	Application Software	<i>INSURSYS</i> Insurance Underwriting application providing features and functionality for Business Partner maintenance, quote preparation, policy generation, policy endorsement, policy document generation, policy renewal, preparation of statements of accounts for brokers, claims processing, reinsurance and report generation.
2	Computer Hardware and Infrastructure	Server, 12 workstations and Local Area Network that allow all workstations to access INSURSYS application.

Source: Compiled by author

5.8.2.2 Human IT Resources

The Human IT Resources available to ABCGI consist of IT technical skills for supporting the Technical IT Resources as well as skills for managing using the available IT resources. A summary of the Human IT Resources for ABCGI is shown at Table 5-23.

1. Technical IT Skills

The Technical IT skills available to ABCGI are provided by the central Group IT Department of the ABC Group of companies, who are responsible for deploying and supporting the ABCGI's IT applications and hardware. The Group IT Department has a full-time staff of 5 persons, which includes the IT manager. One IT staff member is assigned as the primary IT Support officer for ABCGI, and is the first point of contact within the IT Department for IT assistance to ABCGI. However, if the designated support officer is unavailable, or if additional technical manpower and skills are required, other members of the IT staff provide assistance. The IT Department also has a standing arrangement with a local IT consulting firm to provide additional technical assistance. According to the IT Department, this assistance includes an average of 16 hours per week of on-site support to address database and report design issues.

2. In-house IT Support Skills

ABCGI does not have specialist IT staff. However, an Administrative Assistant has been designated as a systems administrator, and is responsible for recording technical problems encountered by the users and liaising with the IT Department and external support persons.

The Administrative Assistant has been trained to resolve simple user-level problems such as reprinting documents that failed to print, but is not able to deal with problems such as network or database problems that require significant IT technical knowledge.

3. Management Ability to identify IT needs

The AM believed that the management of the business unit played a significant role in deciding what the requirements of the IT system were, and in choosing the system. He stated:

“Our [management] role initially was to decide what we wanted with the IT system. We knew what we wanted from the IT system and we looked at various options and the one that best suited us, in terms of value for price, we went for that one. The actual roll over, I don’t think we were involved in that.”

He also identified middle management and users as the ones taking the initiative in identifying whether the functioning of the system was meeting their needs:

“...Middle management and generally the users of the system, some of them know what they want out of the system so they realize this is what we want and we are not getting it or they realize the system is not working as it should and they would put that to the MIS department and the IT Department would try to sort it out.”

Table 5-23: Summary of Human IT Resources for ABCGI

	Resource	Description/ Remarks
1	Technical IT Skills available from IT Department	The IT Department is responsible for providing implementation and technical support services to the ABGGI. The Department also has arrangements with a consulting firm to provide approximately 16 hours per week of on-site support to address database and report design issues.
2	In-house IT support skills	ABCGI has designated an Administrative Assistant as an in-house systems administrator to provide first line support to users and to liaise with the IT Department and external support persons.
3	Management ability to identify IT needs.	Management of the business unit are able to identify the requirements for the IT system and determine whether or not the system is meeting their needs.

Source: Compiled by author

5.8.2.3 Complementary Organizational Resources

Only one Complementary Organizational Resource emerged clearly from the data. This is shown in table 5-24 below.

1. Management Support for IT

The main Complementary Organizational Resource identified was a supportive attitude towards IT at the senior management and business unit management levels.

The GM expressed strong support for the adoption of IT in general, and for the increased use of IT by ABCGI in particular. He stated:

“I personally am somebody who believes you have to embrace technology and move on, so I think that everybody has to be capable of moving with the times, so that any business in Saint Lucia, whatever it is has to consider what they are going to do about technology, they can’t ignore it.”

He was also of the view that ABCGI management and staff were supportive of the introduction of the system, despite experiencing implementation problems:

“I think they’re all on board, I don’t think there is anybody resisting it, saying that this is nonsense. Some of the implementation problems might have led to some problems but I think everybody not only management, all the staff are willing to learn and become involved in the whole IT situation, there is nobody resisting it”.

Similarly, at the Group level, there was support for investing in IT. According to the GM:

“I feel that that the ABC Group as a company has shown a willingness to invest in IT. As a company across the board I think that they have shown a willingness to invest in IT.”

Table 5-24 Complementary Organizational Resource for ABCGI

	Resource	Description/ Remarks
1	Management support for IT	Management at both the business unit and the group level showed strong support for increased use of IT within ABCGI

Source: Compiled by author

5.8.3 Contributions

The following were identified as contributions made by the firm’s IT to its competitive position. A summary of the contributions is shown in Table 5-25.

1. Automating “mechanical” aspects of business

The GM identified automation of business processes as one of the main benefits that had been derived from IT. In his view, such automation was necessary in order to grow the business. He stated:

“In fact, I think that the only way you can grow your business, because we are in a volume business, and the type of business we do, the only way you can improve your business is by automating the mechanical side of the business which is as you see me doing there, statistical work, administrative work, accounting work and policy production work. In all those areas and statistics, accounting and policy production, when I first came to ABC 15 years ago we had three policy typists basically typing documents. Now we only have one, and that is partly as a result of automation. ... The only way to go ... these repetitive number crunching, mechanical procedures would have to be automated, there is no other way to do it.”

The automation of the “mechanical” aspects of the business has led to other benefits, including the reduction of labour costs, which is discussed below.

2. “Cut down” on labour costs

The company had been able to reduce its labour costs as a result of its use of IT. The GM cited as an example, the reduction in the number of policy typists because there was less manual document preparation to be done, and the merging of two existing jobs:

“In actual fact we’ve seen a couple of jobs merged. I wouldn’t say made redundant, but we’ve merged 2 jobs into one because IT enabled us to do that”.

The reduction in costs was an important contribution, given the managers’ view that the much of the competition in the industry was based on price. The CEO also emphasized why using IT to reduce labour cost was important for the competitiveness of ABC Group’s businesses when he stated:

“I think we have recognized that labour is a major pawn in a number of the businesses. You can improve your position - either making your labour more efficient, or extracting labour by reducing some of the frills that you would offer in the business. In other words you can offer a lower level of service but in exchange for that the customer gets a better price, or you find a way of making the people that already exist more efficient so that they can handle a lot more business in the same amount of time, and your customer still gets the same service they are accustomed to but they get better pricing. You have to take costs out of the business.”

3. Responding more quickly to requests

The AM explained that because “brokers want things a lot faster”, the use of IT helped improve the competitive advantage because it gave ABCGI the ability to respond more quickly:

“You’re dealing with brokers who place business everywhere, you are dealing with about four or five insurers who charge the same rate, the policies are, never mind what they say, relatively the same, it’s the same product they are offering. With the brokers, if you can give them the information that they want, faster than the other person, and it makes them look good in the person’s eyes, that is an advantage.”

The conclusions of the assessment by the IT Manager supported the view that INSURSYS has allowed ABCGI to respond more quickly to brokers, and had been able to derive some advantage from that. The report stated:

“Several Insurance Brokers have expressed appreciation about increased speed of service. In the past Broker transactions would have taken some time because of the number of transactions involved (on behalf of several clients). The immediate generation of documents by the system now meant that can spend less time at ABCGI.” (p. 50).

4. Improved Customer Service

The AM identified “producing information reports, answering clients queries, producing documentation for clients faster” as one of the main benefits of the implementation of INSURSYS. He further explained why improved customer service was one of the contributions derived from INSURSYS:

“I think we serve customer a lot quicker now. I think that’s the one good thing on the system, I think we serve customers a lot quicker. I know brokers say that all the time, they can come in and out there very quickly. Especially with the triggers and everything.”

The Underwriting Supervisor attributed the improved customer service to required information being more readily accessible:

“Now you have much more information easily accessible, more readily accessible on your computer, not having to pull up the policy number and then go and find the file to answer simple queries be it for the bank, for the client, for a broker. That’s one the advantages of the new software. “

The contribution to improvement of customer service was confirmed by the IT Managers’ assessment, which stated:

“There is general agreement among the stakeholders being studied that customer service had improved, particularly with regard to the generation of

customer documents. With the advent of database triggers, all the relevant documents for an insurance policy transaction are generated by the system immediately. Prior to this, each document had to be generated by the agent one by one.” (p. 50)

5. Ability to monitor percentage of business being renewed

The company had benefited from using IT to monitor the percentage of policies that were renewed. The AM identified this benefit in response to a question on the role of IT in the company’s strategy:

“We’ve been using IT in that at any time we can print a report that would show us what notices we send out and what we’ve actually effected cover on, which would give us an idea of what percentage of our business we’re renewing, so it does to a limited extent using IT helps that is our strategy....”

Table 5-25: List of “Contributions” for ABC General Insurance

	Contribution	Description
1	Automating “mechanical” aspects of the business	The ability to automate the “mechanical” (repetitive) aspects of the business had contributed to the competitiveness because it allowed Insurance to support a greater volume of business. It had also allowed ABCGI to reduce staff.
2	“Cut down” on labour costs	Increased use of IT had allowed ABCGI to reduce its labour costs. It was able to reduce the number of policy typists from 3 to 1. Reduction of labour costs was considered important to the competitiveness of ABC Group businesses.
3	Responding more quickly to requests	ABCGI was now able to respond more quickly to requests from brokers, and serve them more quickly. The ability to respond more quickly had increased the firm’s competitiveness.
4	Improved Customer Service	The ability to immediately generate the customer documents on completion of a policy transaction led to improve customer service.
5	Ability to monitor percentage of business being renewed	Use of INSURSYS made it possible to easily determine what percentage of policies was being renewed. This helped in planning strategy.

Source: Compiled by author

5.8.4 Inhibitors

The following factors were identified from the interviews and other data as inhibiting the extent to which the firm’s IT contributed to achieving or improving competitiveness. A summary of the inhibitors identified for ABCGI is shown in Table 5-26.

1. Technical System Problems

The occurrence of technical failures or “crashes” and other technical problems while using INSURSYS emerged as a significant impediment to ABCGI’s ability to derive greater benefit from the system. This was identified as contributing to slow system performance, incorrect data and slow customer service. The GM characterised these difficulties as “implementation problems”, and identified them as part of the reason why INSURSYS was not currently meeting expectations He stated:

“We’re not getting what we expect right now, but I personally I just believe these are implementation problems. I was surprised that [the vendor] would supply a system with so many bugs... I’m wondering if [the vendor] didn’t test their product adequately before they even supplied it to us.”

As a specific example he cited the problem of “automatic logouts”, where a user session would be unexpectedly terminated:

“There are frequent automatic log outs where the system will just tell everybody you have to stop because of some data base problem I don’t know. I don’t understand fully, but either the data base becomes over loaded or it would become confused”

The “automatic logout” problem was also reported in the Assessment Report prepared by the IT Manager, which stated that “users were experiencing problems such as abnormal terminations and the inability to process certain transactions in the system” (p. 9).

The “automatic logout” problem was only one of several technical failures that had been identified. A review of the minutes of meetings, correspondence between the IT Department and ABGGI staff and between the IT Department/ABCGI and the product vendor showed that the subject of technical problems dominated discussions about INSURSYS.

For example, ABCGI minutes of a meeting between the IT Department and ABCGI to discuss the system, in September 2005 noted:

“[The Accountant]” informed the meeting of the problems currently being experienced with INSURSYS, namely, the difficulties in printing reports, and errors in the reports, where tables have wrong information” (Source: Minutes of “Computer Meeting” held on 20/Sep/05)

The minutes of a subsequent meeting contained the following entry:

“[The IT Support Officer] suggested evaluating all issues and deciding whether we should continue using INSURSYS., stating that it is unfair of [the Vendor] to charge us for something that should be working but does not work”. (Source: Minutes of “Computer Meeting” held on 08/Feb/06).

Also, the IT Officer identified the following problem during an informal discussion with me:

“Occasionally, the "application servers" close for unknown reasons, making it necessary to execute a restart. When this happens, users are forced out of the system. The problem has been reported to the vendor but the vendor has not been able to offer a solution. This occurs about twice per month.”
(Discussion with IT Officer, 30/May/07)

The occurrence of the technical problems had a negative effect on the company’s customer service functions as it caused delays in providing service to customers. This was documented in the IT Manager’s Assessment Report which stated that “certain transactions cannot be performed in a reasonable time without the system and when these system problems occur customers get frustrated” (p.50). Another factor identified in the report as contributing to that problem was that “customer documents (e.g. statements), required detailed review to detect errors” (p. 50).

The Underwriting Supervisor also explained that delays caused by system failures sometimes led to negative reactions from customers:

“There have being instances where client has been frustrated, because we appeared to come across as being inefficient, because the software is either slow, or something has crashed. So you may find someone with a complaint about the level of service because we were waiting for the system to do something that it couldn’t do or for someone to fix something that would have taken a little bit of time.”

The correspondence between the vendor and ABCGI also showed that while the vendor attributed some of the reported difficulties to incorrect actions by the user, it also acknowledged that several were system defects, (including the “automatic logout” problem).

2. Inadequate accounting functionality and integration

The absence of integrated accounting functionality within INSURSYS was a significant deficiency. The AM stated:

“The accounting people have a lot of accounting problems, they cannot get all the information they want, and I suspect that’s because we did not buy the entire the entire accounting package”.

The GM also believed that fact that the company did not purchases the available General Ledger module resulted in a “major weakness” in the system. He stated:

“I think we didn’t think about the integration of a general ledger package and we made a major mistake in not buying the full accounting from the same vendor. I think that is a major weakness ... I have been through that before at [another local insurance company] where we made that same mistake as to not buying the general ledger package and not doing a full accounting in the

system- trying to do part accounting in the system and part outside the system.”

He also attributed the decision not to invest in the accounting integration to the uncertainty about the corporate status of ABCGI at the time the decision was taken to purchase INSURSYS:

“When we first considered it we weren’t sure of the start up date for ABCGI, so when we bought INSURSYS originally, we were thinking of it being a department of ABC Limited, and not being a stand alone company - a company in it’s own right. So that the whole question was - how will the accounting system dovetail with the head office system which ABC did all the accounting on? “

The absence of the integrated accounting functionality had two main consequences:

- Accounting data, particularly that arising from policy-related transactions with customers and brokers, had to be re-keyed into the accounting system, therefore creating duplication of work.
- Discrepancies arose between customer and broker account balances in the accounting system and the corresponding balances in INSURSYS. Considerable manual effort was then required to find the sources of the differences and then to correct them.

3. Desire to limit system cost

The managers attributed some of the shortcomings of the system to deliberate decisions made in order to limit the cost of the system. Decisions were made not to purchase some optional modules that were available.

One instance of this identified by the GM was the decision not to purchase the integrated accounting module. This was done in order to save costs:

“I think we were trying to save , cut corners where we shouldn’t. I think we’re paying for that right now.”

The decision was taken by the senior management (at the Board of Directors level). However, the GM acknowledged some responsibility for what he considered to be a “short sighted” decision:

“I think the decision was a bit short sightedmaybe if I had been really insistent and said no I will not accept this, and maybe there was a bit of inexperience on the part of the others...But I wouldn’t blame ABC for not willing to invest.”

The AM also cited an example of a optional feature that he would have liked included in the system, but that the company decided against:

“There was something else I would have liked to get - Automatic Renewals. That would have helped us significantly. Again we were constrained financially.”

He did not think that the constraint existed because the company could not afford the feature, but rather because they did not believe the cost was justified:

“They thought it was just not worth the investment. What I was talking about for \$48,000 [US Dollars], I would have liked to have it, but I don’t think I could really justify the \$48,000.”

Both the GM and the AM attributed the decisions to a view by the company that the additional costs were not justified by the expected benefits. They were not of the view that financial constraints prevented the company from purchasing these modules.

4. Senior Management skepticism about value of application

Although the attitude of the ABC Group-level management was considered positive, the senior management were skeptical about the level of value being derived from the investment in INSURSYS. This was indicated both by the views expressed by the GM and AM at the business unit level, as well as the views expressed by the senior managers themselves, particularly the CEO and the GFD.

The GM attributed this partly to expectations that he considered to be “too great”, and to prior experiences:

“Maybe sometimes the expectations are too great, maybe sometimes they have had bad experiences in trying to implement software in other areas of the company’s business, and so they are a little bit skeptical, they look at the whole thing with a jaundice eye and say, I’ve been through all this headache before and it hasn’t worked. I think that’s partly ... again, maybe they felt like some of the software wasn’t worked out sufficiently in advance, they didn’t go into too much detail...”

The AM also expressed a similar view. In describing his perception of the senior management attitude, he stated:

“They think IT is important, what I think happens with them is that they want it to happen too quickly. The little I know of IT and getting new products, you always have teething problems, but I get the impression that they just want everything to work just like that. It’s not that they are against IT, they fully embrace it and they want to work with it, they just expect it to work right away with no problems, without looking at the uniqueness of the situation.”

The AM also added that the senior management were dissatisfied because “Certain basic things which they expected from the system, they didn’t get. They felt that the system was not complete.”

The CEO's views confirmed the skepticism on his part. He attributed his dissatisfaction to the software not meeting the expectations that he considered to be reasonable:

“For the price that we paid, for how it was represented, I think our expectations were reasonable. I don't think we came with any set of parameters that was outside the norm in the insurance industry. It's not that we are asking for a system that had to do very complex calculations for us. These were, in our mind, very basic requirements of a software system in an insurance company.”

The GFD also expressed views that further reinforced the skepticism. During an interview conducted a few months after the implementation of INSURSYS, he stated:

“Maybe it is a bit premature but we have been into the system for five months now and we have not been able to determine whether we are profitable or not. Now we can guess or we can do an estimate to determine whether or not we are profitable but it is not the sort of implementation that has engendered a lot of confidence from the directors.”

This skepticism led to a lack of confidence in the system, and reluctance to make further investments. In a subsequent interview, the GM reiterated his view about the skepticism of senior management, and the CEO in particular, stating:

“I think certainly the CEO was skeptical, and thought it was a bad investment. I myself was not necessary of that opinion because most of the problems have been in the accounting and not necessarily in the underwriting.”

5. Duplication of work through retention of manual practices

Some of the efficiency benefits expected from introduction of the INSURSYS application were not realized because ABCGI continued to retain some manual procedures that existed before the introduction. This created some duplication because it meant some activities were executed twice, as the AM explained:

“It just affects your efficiency because you do things twice. So it's not like you are not using the IT, you're using the IT to do one thing but you're just doing manually also.”

A specific example highlighted by the AM was the practice of manually writing the reinsurance allocations for each policy on a copy of the policy schedule retained on file:

“To give you a specific example, we have the treaty set up in the system - straightforward. The system breaks down the sums insured, it breaks down the premium. Yet for every risk that I do I manually have to put it on at the back of the schedule... Initially, it was a way of tracking that we had actually done all the policies, so we were actually keeping it in a register so we were

ensuring that all the policies went out. In that sense yes, because we had a lot of back log then. But still you could have register separate from actually stamping it.”

He further explained;

“You put the premium, the percentage and the sum insured but for normal risks, which are 95% of all our risks, all that is on the system. I can query any policy on the system and you will see that breakdown on the system yet still, at the back of every schedule I need to put that in.”

One of the main reasons for such duplication was concern about the need for alternative sources of information in case of system failure. The AM also believed it was partly because “they had always done it that way”:

“I think it is just tradition. They have always done it that way and they and they just don’t want to be solely reliant on a computer system that just go bomb anytime, or it does not function properly and they cannot get what they want, they like to see things.”

Another example observed was related to the maintenance of customer files. Most documents issued to policyholders, including cover notes, and policy schedules, were generated from INSURSYS and kept in the system’s database. The information on these documents could subsequently be retrieved through reports and queries. However, staff of ABCGI retained a practice of printing copies of all such documents and placing them on the customer’s files, which were kept in filing cabinets. When asked why they felt it necessary to maintain those file, the staff explained that they were concerned that when a customer enquires about his policy, it may not be possible to access the system at the time, or data may have been lost or become corrupted due to system “crashes”.

The retention of manual procedures was also due in part to the absence of suitable functionality within the software application to replace some of the manual activities performed. The Underwriting Supervisor explained that some of the documents that were manually copied and stored were not available in electronic format:

“There is also information that you would get on the file that ... we don’t have the software capabilities now ... that you can’t store on the system or computers as far as I know, unless of course you have to scan them in and save them. Proposal forms and that sort of thing which are not generated on a computer. Lots of correspondence is stored in the file - letters from lawyers for instance, claims and sort of thing”.

The possibility of introducing an electronic filing system to address the above had been discussed, but had not been addressed as a priority. This was acknowledged in the minutes of a technical meeting between the IT Department and ABCGI, which stated:

“Briefly discussed the feasibility of implementing an electronic filing system – long term goal”. (Source: Minutes of “Computer Meeting” held on 05/Sep/06)

6. Expectations of Functionality of new system not met

There were several indications that the level of functionality expected from the new system by management and staff were not met and that this contributed to dissatisfaction. These unmet expectations contributed to the skepticism of senior management discussed in section 4 above. It also manifested itself in other areas, such as the accounting and reporting.

Both the GM and AM acknowledged this problem, but believed that it occurred partly because the users’ expectations were too high. The GM stated for example:

“When you plan to implement or to buy a system, are you going to sit down and say to yourself, well suppose a man comes from China with a bamboo house and he is a ship welder and ship building is not something you do in St Lucia ... do you have to make provision in your system to insure Chinese-speaking ship builders with a bamboo houses? You cannot cover every single scenario which comes up. I think sometimes some of the users expect it to do everything without realizing there are going to be limitations to what the system does.”

The AM also believed that users expected the new system to replicate the functionality of the one that it replaced:

“What I find sometimes is that some of them who are used to other systems, - what they were using before, they always try to replicate it. They get a new system but they still want to do what their old system was doing, so they still want certain things I think that are not really necessary, because they used to get it from the old system, and because the old system used to do it like that, they expect the new system to do it like that.”

A specific example of the issue cited by the AM above was the difference in the way the INSURSYS handled queries, compared to the system that it replaced. This was also explained in the IT Manager’s assessment report:

“Another drawback cited was the reduced querying capability of the new system when compared with that of the previous system. They pointed out that the previous system allowed querying on a number of fields. The example provided was that if a color was entered as a search criterion any record with the color would be displayed. With the new system it appeared that the search criterion had to match with the first part of the field being searched on i.e. ‘sea’ would find the word ‘search’ but not the word ‘research’”.(Assessment by IT Manager, December 2006, p 47).

The view of the Underwriting Supervisor, who articulated relatively low expectations of the software, provided some support for the arguments of the AM and GM. She stated:

“It would be nice if I could get everything I wanted out of this software ... but every software has its limitations. I don’t expect that, it would be able to solve all my problems. That was never an expectation that I had. All software systems have limitations. I am pleased with this one to the extent that it is an improvement over what we had previously, but I expect that every now and then we’ll have to do something that I may not necessary like to do, but so be it”.

The Accountant however, strongly disagreed with the view that dissatisfaction with the level of functionality was due to expectations that were too high, as illustrated in the following comment on the reporting capabilities:

“In terms of expectations, we do not do reports for fun, just for doing it sake. We do reports because we need the information, so our expectations are based on what we require, - reporting requirements whether internally or externally to the Registrar of Insurance, whether for financial, auditing purposes and so on. So, I would not say our expectations are too high. You would expect that such a system, especially when you spend so much time and money on it, would give you what you require. I mean obviously we don’t live in perfect world, so there are times when you will have little issues and so on but we have big issues all the time.”

The correspondence and discussions between ABCGI and the vendor however, confirmed ABCGI’s dissatisfaction with the level of functionality. This was reflected particularly in the “*Issues List*”, a document prepared by ABCGI to itemize what it considered to be problems with INSURSYS – whether due to technical errors or absence of required functionality. The document was used as the basis for discussions with the vendor and was constantly updated as issues were resolved. At 10 August 2007, there were 24 outstanding issues on the list. Of these 17 pertained to additional functionality ABCGI required and that was not currently available as compared to 7 that referred to new or recurring technical problems.

7. Difficulty obtaining reports required

It had proven more difficult than expected to obtain desired reports and information from INSURSYS, and this had limited the extent to which the system could be used to support the activities of ABCGI. The CEO indicated that these reporting difficulties led to less utilization of the system that would otherwise have been the case:

“I think the complexity of getting reports, the complexity of getting information out of the system or the lack of availability in some of the reports that you want and the lack of confidence that has come over time ... the staff don’t have the confidence in the system because of the problems we’ve had with it. If there was a very simple way of going in and extracting the information you wanted and everything was seamless and flawless, the utilization of the system, I think would be much more ... I think there would be a lot more utilization of the system.”

One of the negative consequences of the difficulties was that it sometimes forced ABCGI to use manual methods to produce the required information, rather than relying on the reports generated by INSURSYS. The Accountant highlighted a particular example of the “Claim Development Report” that is used to show financial allocations for outstanding claims:

"I do not know, I mean, are the reports too complicated for the system?. I don't think so because, it is what we require. It is not something that we will just do it for fun but ... Basically we have a report called the Claim Development Report, that has to be reported into two forms. What's makes it a little more complicated, is that our underwriting year is not the same as our financial year. So our underwriting year ends in December and our financial year ends in March. So, trying to get these cut off in the system and so on...you basically have to try and do it manually because it is not really working out as yet... So my point is, we take much too long to get reports that we need."

These difficulties were occurring despite the fact that INSURSYS was supplied with an integrated report writer, which should have simplified the process of generating reports. This however, proved more difficult to use than ABCGI had been led to believe. In particular, it required technical knowledge of SQL databases. The vendor had provided initial training in the use of the report writer, but as the AM pointed out, using it to generate reports proved more difficult than expected:

“I know when we looked at the system initially during training and we looked at how they were producing those reports, we thought that this is relatively easy, anyone can do a report, a relatively simple report. But when you actually start doing it, it's nothing like what they showed you during the training, it's a lot more difficult”

ABCGI considered the difficulty in generating the reports to be sufficiently important to be raised as one of 5 priority issues on a letter sent to the Customer Support Manager of the vendor, by the GM of ABCGI, in October 2006. In order to underscore the gravity of the matters raised, the GM started the letter with the sentence:

“I write to you on various matters of concern ABCGI as a client of [vendor] in an effort to avoid deterioration in our two companies' relationship.”

The letter stated the following with regard to the reporting difficulties:

“We have not been able to get the benefits that we had hoped for from this "report writer ". It is not as user friendly for non-technical users as we had expected, following the demonstration here. Therefore, we have to refer creation or modification of all reports to our IT Department. Further, it is my understanding that the reports often provide incorrect results because there is insufficient documentation to make it clear which fields in the data will provide the specific information being sought.”

8. Unreliable Reporting

In addition to the problem of unavailability of some required reports or the difficulty in executing reports, some of the reports provided by INSURSYS produced incorrect or inconsistent results when run. This was explained by the GM as follows:

“The reports ... there are problems getting them to agree...there were inaccuracies ... you know, Accumulations report was not agreeing ... re-insurance figures were coming out differently, more than one report was showing one figure, another figure on another. There were all these types of problems which the Accountant in particular had a hard time trying to get all these things to agree. So you would have a report of the property business. You would print one summary to show you one figure, when you print another summary it shows you another figure and then you have to get to the bottom of it. There were lots of those types of problems. It delayed our reporting.”

The inconsistencies led to delays because additional time had to be spent in investigating and correcting the source of the discrepancies. The problem had affected the firm's accounting in particular. The Accountant explained that there were frequent discrepancies between the accounting information maintained within the firm's General Ledger (GL) system, when compared to corresponding information produced by INSURSYS:

"You have to struggle with reports trying to find out what is wrong. It's either the GL is wrong or the report is wrong. But the GL is correct. Time and time again we check it, it's correct, and it's the INSURSYS report for one reason or the other - maybe the correct selection criteria has not been used, maybe it's because of some data corruption issue or whatever. All the time it happens that it is INSURSYS that is incorrect, and as I said, we are still doing reports three years later by trial and error. Sometimes days of trial and error."

This situation had contributed to diminishing the confidence of management in INSURSYS and the information that it produced, as highlighted by the AM:

“Everything needed to be checked manually, so because of that I think generally now, every....well, I keep thinking about the accounting and reporting side generally, people because of the past experience don't trust the system anymore, and the information that comes out of it...”

The problem and its consequences were also reported in the IT Manager's assessment:

“Management gave the general impression that if the system had better reporting capability less time would be spent obtaining information from the system. The primary issue was the inaccuracy of the reports requiring that time and effort be expended in ensuring that the information is correct. Added time was spent in re-checking report information e.g. Aggregate Report.(p. 50)”

The IT Manager's report also pointed to the negative impact of productivity:

“It was felt that time spent on re-checking reports to ensure that the information provided was correct had a negative impact on productivity. Also the system did not provide some information in the format desired and workarounds had to be found.”

9. Inadequate system controls

The inadequacy of controls to prevent users from entering incorrect data or performing incorrect actions was identified as one of the significant weaknesses of INSURSYS. It also appeared to contribute to other difficulties that were identified.

This problem was frequently discussed at technical meetings between the IT Department and ABCGI, as well as with the vendor. For example, the minutes of the meeting of 20 September 2005 that was cited earlier includes the statement: “[The IT Support Officer] stated that the errors in the reports are because of the controls.” The “Issues List” of 10 August, 2007 also includes the following entry:

“Various features in INSURSYS allow users to take actions that ultimately corrupt system data: e.g. cancellation in the premium booking screen, cancellation of policies without updating policy expiry dates, booking of premiums to incorrect broker accounts, booking of RPs [Return Premiums] in place of APs [Additional Premiums] and vice versa.”

This issue was of particular concern to the Accountant, who raised it correspondence to the vendor’s Customer Support Manager on 31 Oct 2006:

“In general, we wish to reiterate the fact that there appears to be fundamental weaknesses in the error handling and data validation capabilities of INSURSYS that allows the system to accept data that will cause corruption. This we believe is the root cause of several problems that have been encountered. Although this issue has been raised, the responses seem to refer to actions to fix specific instances. Nothing that we have been told so far suggests that [the vendor] acknowledges that INSURSYS has a general data integrity problem.”

The GM also referred to the lack of controls, and while acknowledging that some of the difficulties experienced with INSURSYS were caused by incorrect data entry, the deficiencies in the system made it difficult to determine who was responsible for entering the data:

“We suspect some of these problems are not INSURSYS problems, they were data entry problems... Had there been a proper trail, we would have been able to trace it back and actually see who did the transaction. It doesn’t have that trail somehow. So somebody can do an entry and then you don’t really know who did the entry.”

The lack of controls also contributed to undermining confidence in INSURSYS. As the AM explained, even when individual problems were corrected, there were still doubts as to whether these problems would reoccur:

"Certain problems have been solved, individual problems, but the bigger picture regarding the system and all those controls, I am not sure if this has been adequately addressed. I wonder if this could be adequately addressed. I am not an IT person so I don't know what you have to do to go into a system to ensure that it doesn't...what sort of checks you could do... what rules ... to ensure that a system doesn't allow that sort of thing."

The problem was also identified in the IT Manager's Assessment report, which included the following statement:

"With regard to work processes, the feeling was that the system does not allow sufficient control of user activities. Several problems were identified: (1) Review of user entries before the system updated critical accounting files is not possible. The system was therefore not designed to support one of the primary accounting controls - separation of duties. (2) The system allowed users to enter data or perform various functions 'incorrectly'. These incorrect entries create problems in terms of how data is stored on the system and the output of various reports." (p 51).

The overall effect of the inadequacy of controls was that it allowed the system to accept or maintain incorrect data. This problem manifested itself in incorrect reports and led to a loss of confidence in the system by users, particularly management.

10. Lack of Common Understanding of Requirements and Features

ABCGI managers did not have a clear understanding of the requirements of the new system, and there were also differences in understanding of requirements between ABCGI and the vendor. This was reflected in statements made by ABCGI managers during the interviews as well as in communication between ABCGI and the vendor.

The AM, who was part of the team that did the detailed review of the system prior to selection, explained that his understanding of some requirements only came about after using the system:

"Experience teaches you a lot. If we have to buy a system now, there a lot more things I would be looking for and be asking, but that only came out of experience. Then we didn't know anything. Even this reinsurance thing, that we now talking about with various locations. I mean, that would never be something that would come to my mind. Now it's at the forefront of my mind, if we ever decide to purchase something new."

He also admitted to not clearly communicating some of the requirements, particularly with regard to the reporting. While ABCGI had provided sample reports to the vendor, which the vendor had said "could be done", ABCGI did not explicitly document that these reports were requirements:

“Some of the reports which we said wanted we never told them. I never said well this is X, Y and Z report, we gave them the reports... But you see a lot this I don’t think we documented a lot of it. Because what we did was, we gave them a lot of our reports, saying these are the reports required, can you do it and they looked at it and they said, yes, it can be done.”

The fact that ABCGI had not yet made the transition from insurance agency to insurance company at the time also contributed to the lack of understanding, as the AM explained:

“You have to understand also, a lot of those reports related to us operating as an agency /binder, not necessary as an insurance company...Part of it is that, we were not an insurance company, so we relied heavily on what others were saying.”

The GM also admitted to not fully understanding the requirements at the time of selection. With regard to the reinsurance functionality, he stated that “I guess we did not consider that aspect carefully enough, although what I thought I saw - it was not exactly what I saw.”

This misunderstanding occurred despite the fact that the vendor produced a Functional Specifications document prior to the final agreement, and required ABCGI to “sign off” this document. Although the document specified the types of functions to be provided in the software, it did not specify the details of system behaviour that had now become the sources of dispute.

Table 5-26: Summary of Inhibitors for ABC General Insurance

	Inhibitor	Description
1	Technical System Problems	The occurrence of technical failures or “crashes” and other technical problems while using INSURSYS emerged as a significant impediment to ABCGI’s ability to derive greater benefit from the system. This was identified as contributing to slow system performance, incorrect data and slow customer service.
2	Inadequate accounting functionality and integration	The absence on accounting functionality within INSURSYS made it necessary to re-key transaction information into the accounting system. It also gave rise to errors and discrepancies between customer information in INVENSYS and the corresponding information in the accounting system. Additional time had to be spent correcting these discrepancies. The lack of accounting functionality was due to a deliberate decision by management.

	Inhibitor	Description
3	Desire to limit system cost	Decisions were taken not to purchase optional modules in order to save costs. This included the integrated accounting feature and the Automatic Renewals feature. These decisions led to some of the shortcomings reported.
4	Senior management skepticism about application	Senior management (at Group level) were not satisfied that the system was providing the expected results thus far, and were skeptical about the level of value being derived from the investment in INSURSYS.
5	Duplication of work through retention of manual practices	Some of the efficiency benefits expected from introduction of the INSURSYS application were not realized because ABCGI continued to retain some manual procedures that existed before the introduction. This created some duplication because it meant some activities were executed twice.
6	Expectations of Functionality of new system not met	The levels of functionality expected from the new system by management and staff were not met and that this contributed to dissatisfaction. These unmet expectations contributed to the skepticism of senior management.
7	Difficulty obtaining reports required	It had proven more difficult than expected to obtain desired reports and information from INSURSYS, and this had limited the extent to which the system could be used to support the activities of ABCGI.
8	Unreliable reporting	Some of the reports provided by INSURSYS produced incorrect or inconsistent results when run
9	Inadequate system controls	Inadequate system controls in INSURSYS allowed users to enter incorrect data or perform incorrect system actions. This led to data corruption that contributed to unreliable reporting.
10	Lack of Common Understanding of Requirements and Features	ABCGI managers did not have a clear understanding of the requirements of the new system, and there were also differences in understanding of requirements between ABCGI and the vendor.

Source: Compiled by author

5.8.5 Summary of Resources, Inhibitors and Contributions

Figure 5-7 below shows the summary of Resources, Inhibitors and Contributions identified for ABC General Insurance, as described in the Sections 5.8.2 – 5.8.4 above. The diagram was derived by populating the conceptual model described in Section 5.4.3, with the lists of Resources, Inhibitors and Contributions shown in Tables 5-22 to 5-26.

Figure 5.7 shows that the combination of resources leads to the contributions to competitiveness identified in Section 5.8.3. The broken arrow signifies that the value of the potential contribution is reduced by the inhibitors identified in Section 5.8.4

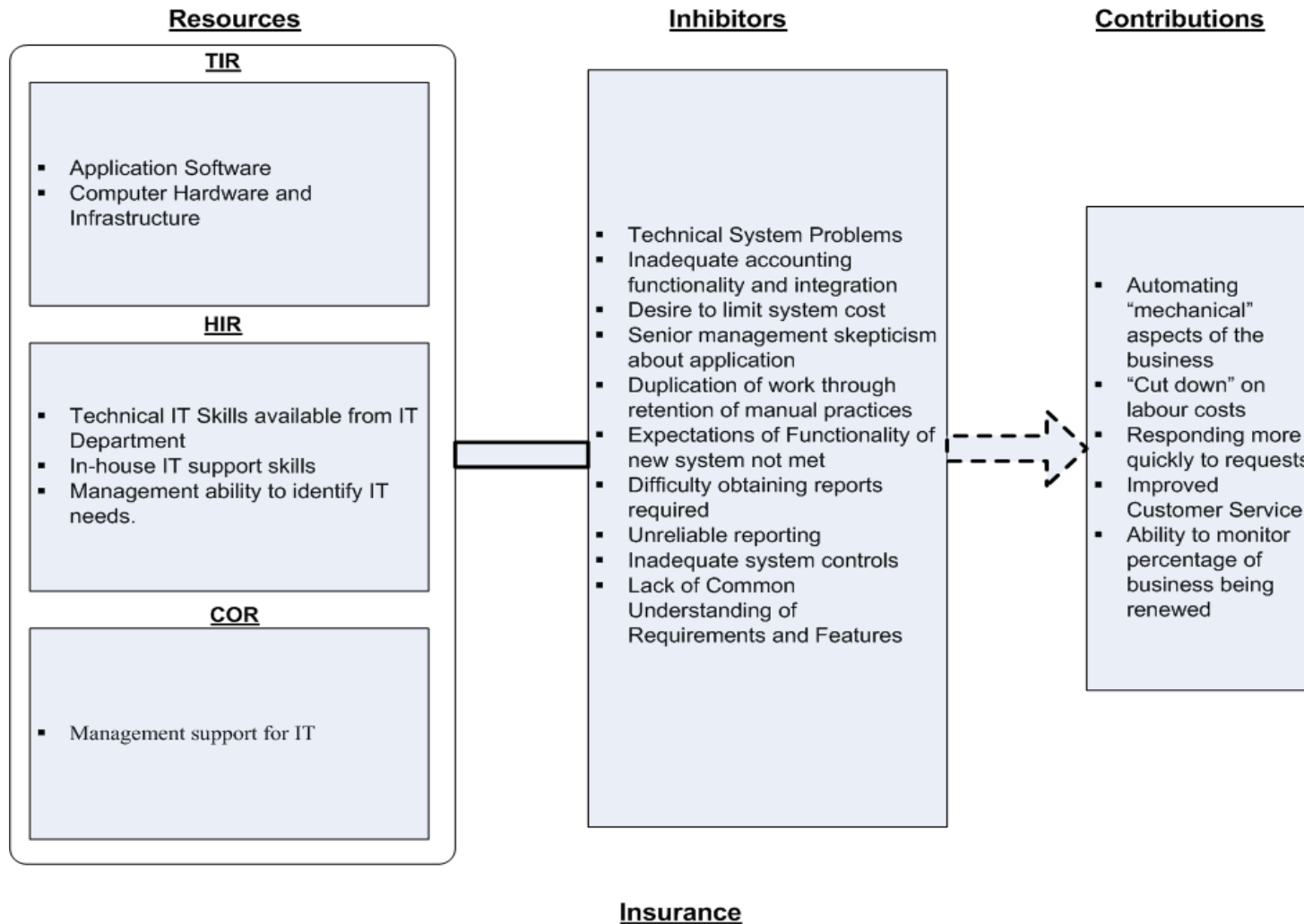


Figure 5-7: Summary of Resources, Inhibitors and Contributions for ABCGI (Compiled by author)

5.8.6 Case Analysis and Discussion

5.8.6.1 Analysis of Inhibitors

Table 5-27 describes the cause and effect relationships among the inhibitors derived from the analysis of the data, as discussed in Sections 3.5.3.2 and 5.3.5. Figure 5-8 shows the causal network derived from the data in Table 5-27 also described in Sections 3.5.3.2 and 5.3.5. The causal network provides graphical representation of the relationships contained in Table 5-27.

Table 5-28 shows the list of *inhibiting factors* identified in Table 5-27 and Figure 5-8, and the number of times each one is involved in “To” and “From” relationships, as discussed in Section 5.3.5. Table 5-28 also shows the shortened “node names” used for each of the factors on the causal network to ensure greater readability of the network.

A total of 34 relationships (Table 5-27) among 34 inhibiting factors (Table 5-28) were identified from analysis of the inhibitors described in Section 5.8.4. From Table 5-28, it can be seen that of the 34 inhibiting factors, 8 have a total connection count of 3 or greater, while 14 have a connection count of 2 and 14 have a connection count of 1. This suggests that those with connection counts of 3 or more may be of greatest significance (Tague, 1995).

The nodes with connection counts of 3 or more are listed below, with the number of connections shown in brackets.

- Decision not to purchase the accounting module (4)
- Senior management expectations not met (3)
- Duplication through retention of manual procedures (4)
- Difficulty in obtaining reports required (3)
- Need to create reports manually to obtain information required (4)
- Unreliable reporting (3)
- Loss of confidence by users (4)
- Not clearly communicating requirements (3)

The decision not to purchase the accounting module resulted from a combination of management’s desire to limit the overall system cost, the management view that the cost of the accounting module was not justified and uncertainty about the future corporate status of what was at the time the ABC Insurance Agency. However, ABCGI had since found the inadequacy of the accounting functionality available from INSURSYS to be an inhibiting factor that ultimately contributed to discrepancies between the accounting information maintained in INSURSYS and that maintained in ACCSYS, necessitating additional manual work to correct those discrepancies. The GM was now of the view that the decision not to purchase the accounting module was an error.

Difficulty in getting reports contributed to senior management expectations not being met. The fact that the requirements for the new system were not clearly understood by ABCGI management and consequently not clearly communicated at the time of system selection also contributed to senior management expectations not being met. Senior management therefore doubted the value of the investment in the system and the data also showed that the senior managers had a negative view of INSURSYS.

Three of the nodes with the highest count - *difficulty in obtaining reports required*, *need to create reports manually to obtain information required* and *unreliable reporting*, all point to unsatisfactory reporting capabilities as a major weakness of INSURSYS.

While *Inadequate system controls* only had a node count of 2, it was a significant inhibitor because as shown in Figure 5-8, it contributed to the loss of confidence by users both directly and indirectly. As the AM indicated, users lost confidence because they could not be sure that problems previously identified were corrected.

The relationships identified in Table 5-27, form 2 separate clusters of nodes in Figure 5-8, containing 28 and 6 nodes respectively. None of the nodes in any of these clusters contains a link to a node in any other cluster, signifying that the data did not show any such connection.

5.8.6.2 Case Discussion

The two main competitive strategies identified by ABCGI management in Section 5.8.1.3 are:

- (a) Attracting relatively low-risk customers who are also willing to pay higher premiums in order to obtain a Premium income to Claims ratio than competitors
- (b) Providing quick responses to insurance brokers to attract and retain more businesses from the brokers.

The local market was described as being price sensitive with similar products being offered by competitors, it is therefore not surprising that of the 5 contributions of IT to competitiveness identified (Table 5-25), 4 can be considered to be mainly improvements to efficiency. These are:

- Automating “mechanical” aspects of the business
- Reducing labour costs
- Responding more quickly to requests from insurance brokers
- Providing better Customer Service by being able to produce documents and respond to queries more quickly

The above suggests that thus far, ABCGI had only been able to derive rudimentary contributions from its IT resources. This is consistent with the observation that only one Complementary Organizational Resource – *Management support for IT* –

emerged from the data, suggesting that ABCGI had thus far had very little success in combining its IT resources with its COR.

The above contributions are derived mainly from the basic ability of the Technical IT Resources to automate clerical or repetitive tasks and to store and retrieve information quickly. These are capabilities that can be expected in any similar system, and as such are neither rare nor difficult to replicate or substitute. Thus in the present state of affairs, ABCGI's IT resources are unlikely to be a source of sustained competitive advantage.

Several of the inhibitors identified in Section 5.8.4, particularly the *Technical system problems*, *Difficulty in obtaining reports*, *Inadequate accounting functionality and integration*, *Unreliable reporting* and *Inadequate system controls* directly reduced the value of the INSURSYS resource, as they limited the functionality and information that could be derived from the application software. For example, the need to prepare reports manually to overcome these inhibitors introduced delays and resulted in additional costs that undermined the potential value of INSURSYS. Also, while the use of INSURSYS was shown to contribute to improved customer service, the inhibitors identified above, particularly the *Technical system problems* and *Unreliable reporting*, also caused delays that resulted in customer frustration, thus reducing the Customer Service contribution.

The *Senior management skepticism about the application* and *Expectations of functionality of new system not met*, directly affected the willingness and ability of the business unit to incorporate the use of the IT application into the operations of the business in such a way as to create unique capabilities that would provide capabilities that were more difficult to replicate and consequently more likely to be sources of sustainable competitive advantage. This was further compounded by the *Duplication of work through retention of manual practices*. The latter had both the effect of reducing the value of the IT resources in that functions that could be performed by the IT system were also performed manually, and in reducing the potential for rareness and inimitability by foregoing an opportunity to embed the system into the business operations.

Given that INSURSYS did not meet the expectations of both the users and of management, the *Lack of common understanding of requirements and features* and *Expectations of functionality of new system not met* are significant. The fact that ABC General Insurance selected a software application that did not meet the requirements of two key stakeholder groups – managers and end-users (Seddon et al, 1999) points to a weakness in the selection and implementation process. This suggests a weakness in the “resource picking” capability (Makadok, 2001), and weakness of the Human IT resources.

The data shows that within ABCGI, there is a preoccupation with resolving the current difficulties with INSURSYS to ensure that the application is functioning correctly and providing the expected functionality. One consequence of this preoccupation is that very little attention was being paid to finding better ways in

which the system can contribute to attaining and sustaining competitive advantage. For example, in various formal and informal discussions, the possibility of offering a web-based interface to customers for functions such as renewals, endorsements and policy enquiries was mentioned. However, this had not been pursued. Given the lack of product differentiation in the market, had ABCGI not been so preoccupied it may have been able to turn its attention to this and other methods of differentiating itself. Also, there was no attempt to use system data for Customer Relationship Management. Given the firm's stated strategy of attracting what it considered low-risk customers, there was no evidence of attempts to use the available system data to assess customer risk profiles and to create incentives to gain more business from those with the best risk profiles.

Table 5-27 Insurance Relationships

	Causes	Effects	Description / Remarks
1	Technical system problems	Users forced out of system	There were frequent “automatic logouts” where users were forced out of the system, due to technical problems.
2	Users forced out of system	Customer service delayed	When users were forced out of the system, this sometimes led to delays in serving customers while the problem was rectified
3	Customer service delayed	Customers become frustrated	Customers sometimes became frustrated because of the resulting delays
4	Technical system problems	Customer documents require detailed review for errors	Because of technical problems it was necessary to do detailed checks of documents for errors before providing them to customers.
5	Customer documents require detailed review for errors	Additional manual work for document checks	The need to do detailed checks of documents created additional manual work for staff
6	Inadequate accounting functionality and integration	Need to re-key data into accounting system	The lack of accounting functionality in INSURSYS and the lack of integration between INSURSYS and the accounting system meant that data had to be re-keyed into the accounting system
7	Decision not to purchase accounting module	Inadequate accounting functionality and integration	The lack of accounting functionality and integration resulted from a decision by management not to purchase an integrated accounting module offered by the vendor.
8	Uncertainty about corporate status	Decision not to purchase accounting module	Uncertainty about the future corporate status of ABCGI at the time the purchasing decision was made contributed to the decision not to purchase the accounting module.

	Causes	Effects	Description / Remarks
9	Need to re-key data into accounting system	Discrepancies between information in INSURSYS and accounting system	Because data was re-keyed from INSURSYS to the accounting system, discrepancies in accounting information arose between the two systems
10	Discrepancies between information in INSURSYS and accounting system	Manual effort to identify and correct discrepancies	Manual effort was required to identify and correct the discrepancies arising between INSURSYS and the accounting system
11	Desire to limit system cost	Decision not to purchase accounting module	Management's desire to keep down the cost of the system contributed to the decision not to purchase the accounting module
12	Senior management not convinced costs were justified	Decision not to purchase accounting module	Senior management were not convinced that the additional cost of some features was justified and this contributed to the decision not to purchase the accounting module
13	Senior management expectations of implementation not met	Senior management skeptical about value of software	The results that senior management expected from implementation of INSURSYS had not been observed and this led them to be skeptical about the value of the system
14	Duplication through retention of manual procedures	Efficiency of operations reduced	ABCGI retained parallel manual procedures for some functions performed by the system, thereby reducing the efficiency of the company's operations
15	Unwilling to rely solely on computer	Duplication through retention of manual procedures	Users' unwillingness to rely solely on the computer system contributed to the duplication through retention of manual procedures.
16	Lack of confidence by users	Unwilling to rely solely on computer	Users' lack of confidence in the functioning of the system contributed to their unwillingness to rely solely on the computer for some functions

	Causes	Effects	Description / Remarks
17	Preference to retain familiar methods	Duplication through retention of manual procedures	Users' preference to perform some functions in the way they were accustomed to contributed to the duplication through retention of manual procedures
18	Software not capable of managing paper documents	Duplication through retention of manual systems	The software did not have the capability to manage the filing of paper documents and this contributed to duplication of procedures as ABCGI needed to maintain copies of all documents related to a policy in a single location.
19	Users expectations not met	Lack of confidence by users	Users lack confidence in the system because their expectations of its functionality were not met.
20	Report writer difficult to use	Difficulty obtaining reports required	The report writer proved more difficult to use than expected and this made it difficult to create the specific reports ABCGI wished to obtain
21	Difficulty in obtaining reports required	Senior management expectations not met	Senior management expectations of obtaining information from the system were not met because of the difficulty in obtaining the reports required
22	Difficulty in obtaining reports required	Need to create reports manually to obtain information required	ABCGI needed to generate reports by manual means to get around the difficulties in getting reports from the system
23	Need to create reports manually	Reports take long time to prepare	Since some reports needed to be created manually, they took a long time to prepare
24	Need to create reports manually to obtain information required	Loss of confidence by users	The need to create reports manually led to a loss of confidence by users
25	Unreliable reporting	Need to create reports manually	The unreliability of the existing reporting functions within the software created a need to create reports manually

	Causes	Effects	Description / Remarks
26	Unreliable reporting	Loss of productivity due to rechecking	The unreliability of the existing reporting functions within the software caused a loss of productivity since the reports had to be checked for accuracy
27	Inadequate system controls	Accept incorrect input	The inadequacy of controls within the software allowed it to accept user input that was incorrect.
28	Accept incorrect input	Data corruption	Acceptance of incorrect input sometimes caused data corruption
29	Data corruption	Unreliable reporting	The presence of corrupt data contributed to the problem of unreliable reporting
30	Inadequate system controls	Loss of confidence by users	The inadequacy of system controls created uncertainty as to whether or not the system was functioning correctly which led to a loss of confidence by users
31	Lack of understanding of requirements	Not clearly communicating requirements to vendor	ABCGI's managers lacked a full understanding of their requirements and thus did not clearly communicate their requirements to the vendor
32	Not clearly communicating requirements to vendor	Senior management expectations not met	As the requirements were not clearly communicated to the vendor, the senior management's expectations of functionality were not met.
33	Uncertainty about corporate status	Lack of understanding of requirements	Uncertainty about the future corporate status of ABCGI at the time the purchase decision was made contributed to a lack of understanding of the requirements
34	Not clearly communicating requirements	Users' expectations not met	As the requirements were not clearly communicated to the vendor, the users' expectations of functionality were not met.

Source: Compiled by author

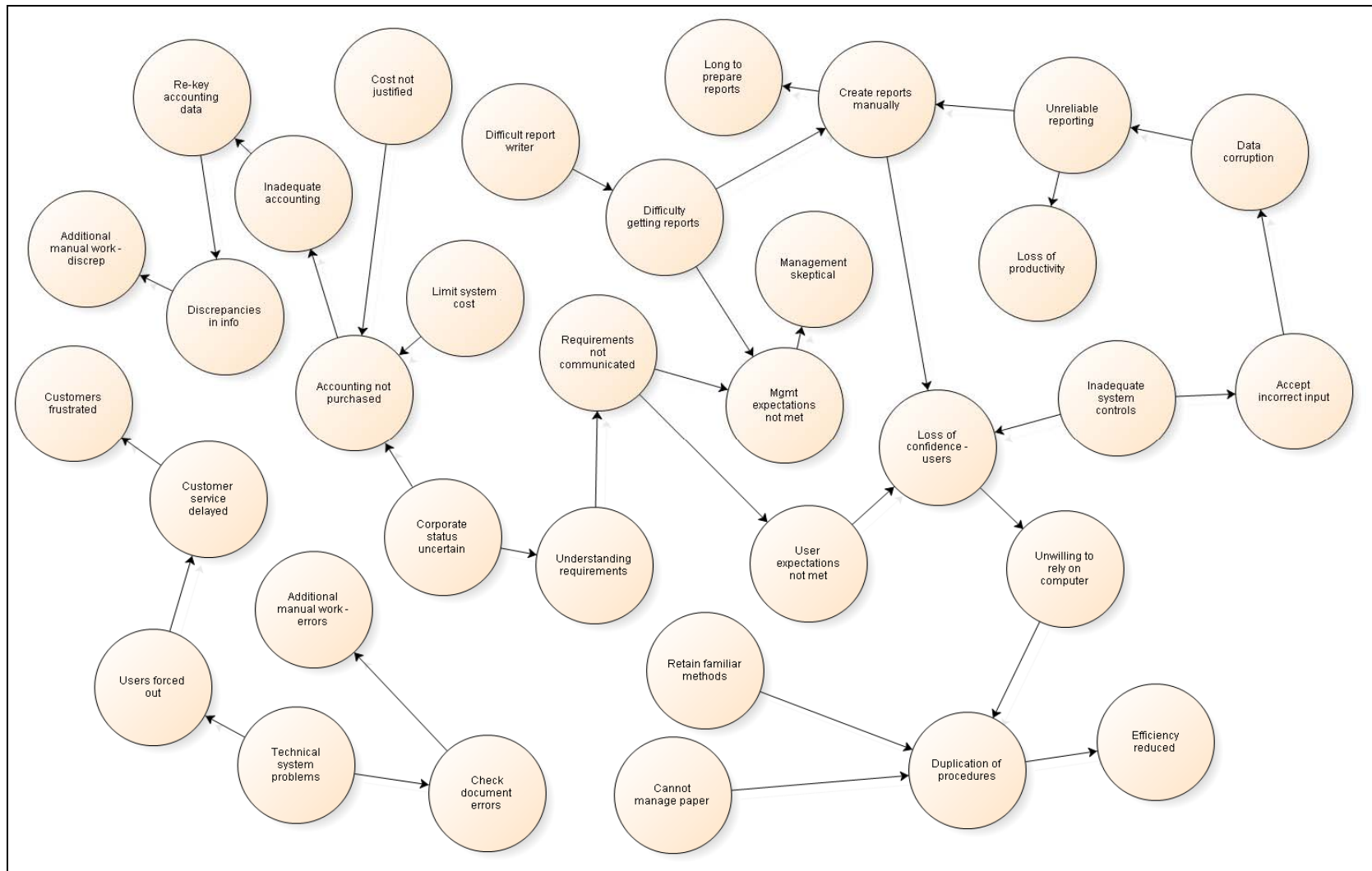


Fig 5-8– Causal Network for Insurance (Source: Compiled by author)

Table 5-28 Inhibiting Factors for ABCGI

	Inhibiting Factors	Node Name (used in Causal Network)	Connection count		
			TO	FROM	TOTAL
1	Accept incorrect input	Accept incorrect input	1	1	2
2	Additional manual work to review and correct errors	Additional manual work – errors	1	0	1
3	Customer documents require detailed review for errors	Check document errors	1	1	2
4	Customer service delayed	Customer service delayed	1	1	2
5	Customers become frustrated	Customers frustrated	1	0	1
6	Data Corruption	Data corruption	1	1	2
7	Decision not to purchase accounting module	Accounting not purchased	3	1	4
8	Desire to limit system cost	Limit system cost	0	1	1
9	Difficulty in obtaining reports required	Difficulty getting reports	1	2	3
10	Discrepancies between information in INSURSYS and accounting system	Discrepancies in info	1	1	2
11	Duplication through retention of manual procedures	Duplication of procedures	3	1	4
12	Efficiency of operations reduced	Efficiency reduced	1	0	1
13	Inadequate accounting functionality and integration	Inadequate accounting	1	1	2
14	Inadequate system controls	Inadequate system controls	0	2	2
15	Lack of understanding of requirements	Understanding requirements	1	1	2
16	Loss of confidence by users	Loss of confidence – users	3	1	4
17	Loss of productivity due to rechecking	Loss of productivity	1	0	1
18	Manual effort to correct discrepancies	Additional manual work – discrep.	1	0	1

	Inhibiting Factors	Node Name (used in Causal Network)	Connection count		
			TO	FROM	TOTAL
19	Need to create reports manually to obtain information required	Create reports manually	2	2	4
20	Need to re-key data into accounting system	Re-key accounting data	1	1	2
21	Not clearly communicating requirements	Requirements not communicated	1	2	3
22	Preference to retain familiar methods	Retain familiar methods	0	1	1
23	Report writer difficult to use	Difficult report writer	0	1	1
24	Reports take long time to prepare	Long to prepare reports	1	0	1
25	Senior management expectations of implementation not met	Mgmt expectations not met	2	1	3
26	Senior management not convinced costs were justified	Cost not justified	0	1	1
27	Senior management skeptical about value of software	Management skeptical	1	0	1
28	Software not capable of managing paper documents	Cannot manage paper	0	1	1
29	Technical system problems	Technical system problems	0	2	2
30	Uncertainty about corporate status	Corporate status uncertain	0	2	2
31	Unreliable reporting	Unreliable reporting	1	2	3
32	Unwilling to rely solely on computer	Unwilling to rely on computer	1	1	2
33	Users forced out of system	Users forced out	1	1	2
34	Users' expectations not met	User expectations not met	1	1	2

Source: Compiled by author

5.9 Cross Case Analysis and Discussion

5.9.1 Overview

Despite the three business units studied in the cases above being parts of the same firm with centrally managed IT services, the study painted very different pictures of the way they were using IT to help achieve competitive advantage. Also, a different set of inhibitors emerged in each case, with a unique set of relationships. This is not surprising however, since these units were in different lines of business, and because the managers had considerable autonomy over the decisions on the deployment and day-to-day use of IT. The following sections discuss some of the key observations derived from the cross-case comparison and analysis.

5.9.2 Nature of contribution of IT

Several of the contributions identified in the study are based on IT helping to improve operational management or to improve decision-making. In the case of Drugstore and Home Store, which were both in the retail business, improved purchasing was a significant benefit. In the Drugstore case in particular, the managers were able to make a very clear connection between the information that they were able to derive from the system, and the improved competitive performance that resulted from Drugstore being better than its rivals at selecting and purchasing products for sale.

It is noted in the case of Home Store that a competitive advantage was attributed directly to the use of the use of the INVENSYS-SQL application, while in the case of Drugstore, the advantages were attributed to the information available because of use of INVENSYS, rather than being attributed directly to INVENSYS. In both cases however, the IT resources were providing the advantages because the businesses were able to use IT to leverage other resources and organizational capabilities, consistent with the arguments that have often been made in the RBV literature (e.g. Powell and Dent-Micallef, 1997; Zhang and Lado, 2001). Such leveraging was made possible by the availability of Complementary Organizational Resources (CORs) such as availability of funds to invest in IT, and supportive management attitudes towards IT as well as the technical skills to implement IT.

Thus, Home Store was able to use its IT system to leverage its network of branches to strengthen its appeal as a “one-stop shop”. The networked POS system allowed customers to make purchases from any branch by just visiting one branch. In the case of Drugstore, it was able to use the better information available to leverage its access to overseas vendors to obtain a better product selection and better prices.

Drugstore, like Home Store, also considered its greater number of branches compared to competitors to be one of its competitive advantages. However, unlike Home Store, it did not have a networked system that allowed one store to sell goods from another. The fact that Home Store had such a system in operation shows that the ABC Group is able to implement this capability, suggesting that is missing an opportunity to leverage Drugstore’s network of branches.

For ABCGI, the contributions resulted mainly from improvements in efficiency such as automating clerical tasks and reducing labour. Although ABCGI identified “improved customer service” among the benefits, closer analysis shows that this resulted primarily from faster preparation of policy documents. It also emerged that ABCGI had fewer CORs than the other two business units to help it derive contribution. The absence of a funds (or a willingness) to invest further in IT is particularly notable.

Overall, while there are examples of IT being used to improve customer services, there are no examples where IT is used to change the model of delivery of customer service, for example, via web-based or other electronic forms of service delivery. Also, the Customer Relationship Management (CRM) capabilities in the existing software were limited to maintaining contact details for customers and records of their purchase history. In the case of Drugstore, the company had not attempted to use the Customer Loyalty capability, although the need for such a facility had been recognized. While there was evidence that several managers were aware of the potential for more advanced application of IT, these were not currently being pursued.

Within the IT value literature, use of IT to maintain direct links with suppliers to improve supply-chain management through *inter-organizational systems* (e.g. Kerns and Lederer, 2004; Powell and Dent-Micallef, 1997) and for CRM (e.g. Kohli and Deveraj, 2004; Piccoli and Ives, 2005; Ray et al, 2004) are considered to be among the ways IT contributes to sustainable competitive advantage. The absence of uses such as those mentioned above, along with the lack of integration discussed in section 5.9.5.2, points to a relatively low level of *maturity* in IT implementation and use. Although the concept of maturity is often associated with early “stages of growth” models that are no longer widely used (see for example: Cerpa and Verner, 1998; Galliers and Sutherland, 1999; King and Kraemer, 1984; Larsen, 2003; Nolan, 1979), the concept is relevant in the context of this study as it could help explain differences between the nature of IT contributions in developed countries versus developing countries such as the those of the Caribbean.

5.9.3 Types and Effect of Inhibitors

While each case gave rise to a different set of inhibitors and different patterns among the inhibitors, there are some commonalities that can be identified. The following common themes or groupings emerge from analysis of the inhibitors identified (Tables 5.-12, 5-19, 5-26) and the relationships shown in the causal maps (Figs 5-4, 5-6, 5-8).

- (a) **Technical IT Problems.** These are inhibitors that directly affect the Technical IT Resources (TIR) and cause the IT system to function incorrectly, or reduce the ability to function correctly. “Technical system problems” emerged prominently in all 3 cases, but appeared to have the greatest impact in ABCGI. In all cases, as can be seen from the causal maps, “Technical System Problems” contributed to other inhibitors. For example, in ABCGI, this contributed to unreliable reporting,

while in Home Store “slow system performance” – due to the network and servers running too slow, contributed to “slow customer checkout speed”.

- (b) **Inadequate Functionality.** These inhibitors occurred where the available TIR did not provide the functionality expected or required by the business unit. Examples include the “Inadequate Purchasing Reports” in Drugstore and inadequate accounting functionality and integration in Drugstore and ABCGI. Inadequate functionality was particularly prominent in ABCGI, where the application software did not provide features that the management expected.
- (c) **Underutilization of available IT.** These inhibitors occurred where the management and staff were not making use of capabilities that were available. This was identified in both Drugstore and Home Store and applied both to the management and staff. In both cases these had high levels of connection to other inhibitors in that several inhibitors contributed to this situation while the underutilization contributed to several other inhibitors.
- (d) **Inadequate IT/Business skills.** These inhibitors occurred where the combination of IT and business-specific knowledge and skills required to take full advantage of IT were not available. This was identified for both Drugstore and Home Store, and was particularly prominent in Drugstore, where the management believed that unavailability of an individual in either Drugstore or the IT Department who had a combination of knowledge of IT and Drugstore’s business was preventing Drugstore from achieving potential benefits. A related issue is that of inadequate training for users, which also emerged in Drugstore and Home Store.
- (e) **Weak IT/Business alignment.** These inhibitors occurred where the business processes were not designed or executed in a manner that allowed them to take advantage of the available IT. For example, ABCGI maintained some manual procedures even though the IT system provided the functionality that would allow these to be eliminated. In Home Store, the receiving process was not designed to take advantage of the features of INVENSYS-SQL, and led to delays in goods being made available for sale. In the case of Drugstore, the available Customer Loyalty feature had not yet been implemented, as the company had not yet decided how it wanted a Customer Loyalty programme to operate.

The results also shed light on how inhibitors limit the contribution of IT to attainment of sustainable competitive advantage, within the RBV framework. Two main mechanisms can be identified:

- **Reducing the potential value of the individual resources.** Barney (1991) states that “resources are valuable when they enable a firm to conceive of or implement strategies that improve its efficiency and effectiveness” (p. 106). Thus by reducing the role a particular resource can play in conceiving of or implementing such strategies, an inhibitor is reducing the value of the resource. For example, in the Drugstore case, the failure of the staff to use the IT system to redirect customers to other branches where a desired item was available reduced the value of the IT

system. Also, in the case of ABCGI, “unreliable reporting” reduced the value of the INSURSYS application. All the types of inhibitors in the above classification can potentially reduce the value of resources, but it can be expected that “Technical IT Problems”, “Inadequate Functionality” and “Underutilization of available IT” are the most likely to have that effect since they are the ones that most directly affect the TIR.

- **Limiting the ability to combine resources effectively.** It is widely accepted that while IT resources may be valuable, by themselves they are unlikely to have the “RIN” attributes that are also necessary to become sources of sustained competitive advantage. These attributes can be obtained however, by combining the IT resources with other firm resources to develop unique capabilities. Thus inhibitors can limit the potential contribution of IT to achieving sustained competitive advantage by preventing or reducing the ability to combine resources and capabilities in a way that would allow them to become rare, imperfectly imitable and non-substitutable. For example, in Drugstore and Home Store, “Inadequate training for staff” limited the firm’s ability to effectively combine IT resources with internal procedures to find new ways to make effective use of IT.

5.9.4 Sustainability of Competitive Advantages

The sustainability of competitive advantage is a matter that is central to RBV logic. However, it is also very problematic to operationalize in empirical studies (Picolli and Ives, 2005; Hidding, 2001; Wade and Hulland, 2004). According to Barney (1991), a firm is said to have a *sustained* competitive advantage “when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy” (p. 102). He further states that “a competitive advantage is sustained only if it continues to exist after efforts to duplicate that advantage have ceased.”

As Hidding (2001) points out in discussing the difference between “sustainable” and “temporary” competitive advantage: “It [Resource-based Theory] does not, however, determine how long temporary might be in terms of months or years, other than implying it is shorter than forever” (p. 206). This makes the definition of sustained competitive advantage impractical for assessing whether the business units in the study have derived sustained competitive advantage from their IT resources.

Given the difficulties mentioned above and the fact that the study did not review data pertaining to an extended period, it would be impractical to attempt to assess whether the advantages to which IT contributed were sustained. It is possible however, to comment on the likelihood that IT will contribute to making the competitive advantages *sustainable*. This requires assessing whether the resources are Valuable, Rare, Inimitable and Non-substitutable. Following Wade and Hulland’s (2004) example, we will substitute “difficult to imitate” for “inimitable” and “difficult to substitute” for “non-substitutable”.

In the cases presented in this chapter, the Technical IT resources are valuable, but are not rare – they are also available to other competitors who are able to afford them and choose to acquire them. In the case of Drugstore for example, it was known that some of its local competitors were also using INVENSYS. Additionally, there are other applications available on the market that provide equivalent functionality. Thus, as has been stated previously, these resources by themselves will not be the source of sustainable competitive advantage.

Both Drugstore and Home Store have been able to combine the Technical IT Resources with other firm resources to create capabilities that are difficult to imitate for the time being. In the case of Home Store, it has combined the use of IT with its branch network to create a “one-stop shop”, while Drugstore has combined the improved information available from the IT system with its purchasing capabilities to offer a better product selection.

There is no *prima facie* reason to believe however, that other firms will not be able to emulate these strategies over time, and use IT in a similar manner to erode the advantages that these businesses have derived. Thus the competitive advantages that the firms have derived from IT are likely to be temporary.

Eisenhardt and Martin (2000) use the Dynamic Capabilities framework (Teece et al, 1997) to argue that in fast changing environments, firms are unlikely to be able to generate sustained competitive advantage. Instead, firms are more likely to be able to generate a series of temporary competitive advantages. Thus, for these businesses, best opportunity for deriving sustainable competitive advantage from IT resources would arise if the businesses are constantly improving the ability to select, deploy and use IT.

In the ABCGI case, the business is deriving even less value from its IT resources. As such, IT is even less likely to contribute to sustainable competitive advantage, unless there is a significant improvement in the quality and use of the IT Resources.

5.9.5 Additional Issues

The following are additional issues that emerged in relation to specific resources or inhibitors.

5.9.5.1 Provision of IT expertise

Both Drugstore and Home Store identified inhibitors due to perceived inadequacies in the Human IT Resources available to them. In the case of Drugstore, the view of the management was that the business unit needed to have staff that were more technically skilled in IT whereas in the case of Home Store the business unit management wanted the IT Department to provide greater assistance in training the staff and advising on additional ways to benefit from the available IT resources.

In both cases, the centralized nature of the IT Department contributed to the inhibitor. In the case of Drugstore, the lack of business-specific IT knowledge was identified as a factor while in the case of Home Store it was inadequate time available to provide the assistance.

The question of the optimum organization of the Human IT Resource has been approached from different perspectives in the IS research literature including “IT Governance” (Peterson, 2004; Sambamurthy and Zmud, 1999), business competence of IT professionals (Bassellier and Benbasat, 2004; Peppard, 2001) and IT competence of business managers (Bassellier et al, 2001). Also, Tanriverdi (2005, 2006) explored the concept of “IT synergies” that result from sharing of IT expertise in multi-business firms.

As Samburthy and Zmud (2000) point out, the imperatives of the “digital age” make it necessary to consider more complex structures for organizing IT services in an organization, beyond the traditional focus of “centralized”, “decentralized” and “federal”. The results show that the current structure, which fits Sambamurthy and Zmud’s (1999) description of “federal”, is no longer able to meet the needs of the business units studied.

5.9.5.2 System Integration – “Core” Application to Accounting System

All of the business units studied used the same accounting system (ACCSYS) and none of them had implemented an interface between the core application and the accounting system. Both Drugstore and ABCGI identified the lack of an interface between the accounting system and their core applications as an inhibitor. In both cases, the ultimate result was discrepancies between corresponding information between the two systems, and the need for manual effort in correcting it. Despite recognizing this, neither business unit had taken the available opportunity to correct the situation. ABCGI had taken a deliberate decision not to invest in an integrated accounting module while Drugstore, despite having allocated funds for purchasing a new system, had not placed emphasis on acquiring the new system.

There is evidence in both cases that the senior management at the corporate level view the integration of the accounting system with the core application as less important than the managers at the business unit level. The CEO acknowledged that the acquisition of a new accounting system for Drugstore was delayed because corporate management wanted to consider the implications at the corporate level. Also, one of the reasons for not purchasing the accounting module for ABCGI was that the senior management did not believe the cost was justified.

5.9.5.3 Availability and Quality of Technical IT Resources

The financial position of the target firm was such that it was able to afford the IT resources that it deemed worthwhile and justified. Despite this, the firm appears to have selected an unsuitable system for ABCGI. Melville et al (2004) summarise the “received wisdom” of several IT value business models as follows:

“If the right IT is applied within the right business process, improved processes and organizational performance result, conditional upon appropriate complementary investments in workplace practices and organizational structure and shaped by the competitive environment.”(p. 292)

The question that arises therefore is how does a firm come by “the right IT”? Makadok (2001b) explains that one of the mechanisms firms use to create economic rents is *resource picking* – being better than their rivals at selecting resources. In much of the RBV literature however, there is an implicit assumption that a firm can easily get the technical IT resources that it requires and there is generally little discussion about how firms can ensure that they have the right IT. Such an assumption would be consistent with the “IT is a commodity” argument advanced by many authors, but perhaps most controversially by Carr (2003).

The experience of ABC General Insurance shows that despite having the requisite human and financial resources, a firm may have difficulty acquiring and implementing an IT system that matches its requirements. Piccoli and Ives (2005) also argue that the documented high failure rate of IT projects casts doubts on the “easily replicable” hypothesis, referring in part, to Carr’s arguments.

The above suggests that the ability to select and implement IT is a capability that may not be as homogenous and widely available as implied by the literature, and as such, can contribute to the achievement of sustainable competitive advantage.

5.9.5.4 Individual attitudes to IT use

In both ABCGI and Drugstore, staff attitudes emerged as inhibiting the use of IT, but for different reasons. In ABCGI, this was because of a loss of confidence in the system, due to inadequate system controls, and the need to create reports manually, because those produced by INSURSYS were unreliable. In the case of Drugstore, the age of the staff was perceived as contributing to this.

I obtained additional data from the Human Resource Department on the ages of staff. Table 5-29 below shows the distribution of ages of staff broken down into 10 year intervals. Table 5-30 shows a similar analysis according to years of service. The data shows that on average, Drugstore staff were older. For example, Drugstore had the highest proportion of staff aged 40 years and over and the lowest proportion of staff aged 30 and under. The technology adoption literature, especially those based on Davis’ (1989) Technology Acceptance Model (TAM), address the question of individual use of technology. Both of the attitudinal factors identified – the lack of confidence in the system and older users being more reluctant to use IT, are consistent with the findings of the empirical technology acceptance literature. However, the literature on technology acceptance is inconclusive as to whether age itself is the inhibiting factor, or whether it is another attribute such as educational background or experience that also varies with age. The available literature does lead us to expect however, that age of staff would be more of an issue for Drugstore than for the other business units studied.

Table 5-29: Analysis of Age of Employees by Business Unit

Age range	Drugstore		Home Depot		Insurance		Totals	
	No.	%	No.	%	No.	%	No.	%
Under 20	13	10.6	19	10.8	2	12.5	34	10.8
20-30	51	41.9	89	50.6	7	43.75	147	46.8
30 – 40	27	22.1	39	22.2	3	18.75	69	22.0
40 – 50	17	13.9	18	10.2	2	12.5	37	11.8
Over 50	14	11.5	11	6.2	2	12.5	27	8.6
Totals	122	100	176	100	16	100	314	100

Source: Compiled by author from data provided by ABC HR Department – August 2007

Table 30: Analysis of Years of Service by Business Unit

Years of Service	Drugstore		Home Depot		Insurance		Totals	
	No.	%	No.	%	No.	%	No.	%
Less than 1	37	30.3	65	36.9	2	12.5	104	33.1
1 – 5	45	36.9	79	44.9	6	37.5	130	41.4
5 – 10	16	13.1	13	7.4	4	25.0	33	10.5
10 – 15	6	4.9	6	3.4	0	0	12	3.8
Over 15	18	14.8	13	7.4	4	25.0	35	11.2
Totals	122	100	176	100	16	100	314	100

Source: Compiled by author from data provided by ABC HR Department – August 2007

5.10 Chapter Summary

This chapter documented the research conducted in Projects 2 and 3, which constituted the main part of the research. It showed how through a systematic procedure guided by a combination of prior theory and emergent data, causal relationships that reflected the managers' perspectives on the inhibitors they faced in attempting to use IT to assist in improving the competitive advantage of their businesses were derived.

The analysis showed that there was a high degree of interrelatedness among the inhibitors identified within each business unit. It also showed that while there were some commonalities among the inhibitors identified in each of the three business units, for the most part, a different set of inhibitors emerged in each, despite the fact that they were all part of the same firm.

In the next section I discuss the findings of the research in the context of existing literature, and the relevance to both theory and practice.

CHAPTER 6: FINDINGS AND CONCLUSIONS

6.1 Chapter Introduction

The justification for the research was predicated on the arguments that due to changes in the global economic environment, businesses in the Caribbean faced higher levels of competition than was previously the case. Phenomena such as “globalization” and “trade liberalization” had lowered barriers to competition that previously protected Caribbean firms, and as such, competition from outside the Caribbean was expected to be an increasingly important factor. Governments and influential institutions and individuals advocated increased investment in and use of IT as a means of enabling Caribbean businesses to become more competitive, in order to respond to the new or increased threats.

The research reported in this thesis was undertaken to address the need for more systematic empirical investigation of the role of IT in contributing to the competitiveness of Caribbean firms. This became necessary in light of the high expectations of IT, and in the face of evidence of willingness to invest scarce resources in IT, both at the firm and national level. Following a review of the literature that included the “Development” stream (and particularly the “Information and Communications Technology for Development - ICT4D stream) and the “IT Value” stream, the following two research questions were derived.

1. How are private sector Caribbean firms using Information Technology (IT) to assist in surviving the increasingly competitive business climate?
2. What are the firm-specific factors limiting the contribution that IT can make to the competitiveness of the firms?

The research aimed to go beyond the macro-level and public policy discussion that has thus far characterized research on the role and use of IT in the context of Developing Countries. Of particular importance was the assessment of the firm-level impact of IT and issues surrounding the use of IT in Caribbean firms to improve competitiveness.

The Resource Based View (RBV) was used to provide a theoretical framework for the empirical investigation of the research questions. The RBV was chosen as it has become well established within IS research as providing a theoretical basis for determining or explaining a firm’s performance on the basis of its internal characteristics, particularly its resource endowments.

6.2 Findings

6.2.1 Use of IT for Competitiveness in Caribbean Firms

The first phase of the research (Project 1) was designed to address Question 1 and generate an initial empirical assessment of IT use by Caribbean firms that could be used as the basis for further detailed research and analysis. The research question was investigated through an initial exploratory study of the views of a total of 10 IT and business managers in 7 firms in St Lucia and Barbados. The results confirmed that among the target firms, the managers interviewed perceived that the business environment was becoming more competitive. However, increased competition from outside the Caribbean did not emerge as a greater concern than increased local competition, contrary to what had been implied by the arguments advanced during research design.

Three main strategies for responding to the increase in competition emerged from analysis of the data. These were:

- (a) increasing the scale of operations;
- (b) improving operational efficiency and reducing cost of operations;
- (c) increased focus on specific market segments.

Also, several of the respondents believed that one of the ways to counter the threat of foreign competitors in their local markets was to leverage their better knowledge of the local markets.

In all the firms in the study, IT was critical to the operations. However, the patterns of use identified from the study showed that the role of IT was mainly limited to supporting improvements in operational efficiency and reduction in cost of operations. Further, despite managers' understanding of the potential strategic contribution of IT, in practice, the firms' IT resources were being applied mainly towards providing basic functional capabilities, rather than strategic advantages.

While the availability of empirical data on IT use by Caribbean firms is limited, the results above are consistent with what has been reported so far (e.g. CARANA Corporation, 2002, Didar-Singh, 2001, Infodev, 2005; Wresch and Fraser, 2006). For example, CARANA Corporation (2002) reported that firms in St Lucia were using IT only for routine administrative business processes, but that there was little use for core business activities.

Within the ICT4D literature, the tendency is to explain the reasons for lower than expected benefits from IT in firms in developing countries in terms of environmental factors and to recommend interventions to strengthen the "enabling environment" (UNPD, 2005), to make it more favourable for the firms. In its 2006 Information Economy Report, the United Nations Conference on Trade and Development (UNCTAD), outlined the following requirements to achieve "social and economic progress" through ICT:

“Accessibility (in terms of both infrastructure and affordability) must be achieved; security and trust must be established to ensure transaction trustworthiness; and, finally, managers and entrepreneurs must be able to develop the processes and create the organizations that will make efficient use of investments in ICTs” (UNCTAD, 2006 p. 242)

Infodev (2005) identify two components of the enabling environment that the authors argue are particularly important for the Caribbean – “access” and “ability”. “Access” refers to the infrastructure and facilities required to use ICT – particularly communications services and appropriate electricity supply while “ability” refers to the extent to which the intended beneficiaries of the technology have the appropriate skill sets to leverage the technology. With regard to “ability”, Infodev (2005) reports that a “general perception among business and academic circles across the region is there is a lack of skilled labor as it pertains to complex deployment and utilization of ICT” (p. 49).

Mega Ace Consultancy (2006), in a study commissioned to advise the Government of St Lucia on ways to use ICT to help develop the Small and Medium Enterprise (SME) sector, states that ICT is "an absolute essential" if the SMEs are to compete with the outside world and recommends that:

"The Government of St. Lucia must support that effort by creating a clear policy, which is lacking at present, for the support specifically of SMEs, which face specific difficulties; and by creating the conditions for rapid advancement of SMEs in the ICT services and give a fillip throughout the St. Lucian economy in the use of ICT. This calls for action on several levels: infrastructure, legislation, education and public awareness". (p.4)

However, apart from a general discussion of generic issues such as the cost of telecommunications services and shortage of skilled persons, the report does not elaborate on the specific "difficulties" that the firms face in using ICT. Such examples reinforce the need for a methodology and practice for systematically identifying the inhibitors faced by the firms and devising strategies to address them.

The conceptual framework used as the basis for data collection and analysis in Project 1 contained a component for the “External Context” that explicitly investigated the effect of factors external to the firm, on the firm’s use of IT. The results of the study did not point to the External Context playing a significant role. This suggests that despite the focus on the enabling environment in the ICT4D literature, it is necessary to look more closely inside the firms for a fuller explanation as to why they are deriving lower than expected benefits from IT.

6.2.2 Nature and Effect of Inhibitors

The results of Project 1 pointed to a need for an in-depth study to determine why firms in the Caribbean are not deriving the expected level of benefit from their investment in IT. The second research question was investigated through a multi-case study to identify and analyze inhibitors, using a conceptual framework based on the RBV literature.

Several authors have investigated the effect of inhibitors on various aspects of IT adoption and use (e.g Cragg and King, 1993; Debreceny et al, 2002; King and Teo, 1996; Luftman et al, 1999; Teo et al, 2006). Cragg and King (1993) identified motivators and inhibitors to growth of IT use in small firms; King and Teo (1996) investigated motivators and inhibitors on strategic use of IT; Luftman et al (1999) investigated enablers and inhibitors of Business-IT alignment. These earlier authors considered inhibitors to be the opposite of enablers, as opposed to specific factors in themselves. More recently however, some authors have been focusing explicitly on inhibitors. Both Debreceny et al (2002) and Teo et al (2006) focused on inhibitors to the deployment of E-Commerce.

In all these studies, inhibitors are conceptualized as independent factors. The available literature has generally not made explicit the fact that the inhibitors can be highly interrelated.

Teo et al (2006) for example, use a Technology-Organization-Environment framework to investigate inhibitors to the adoption of Business-to-Business (B2B) e-commerce. The study investigated inhibitors in three "contexts" - the technological context, organizational context and environmental context. The technological context refers to both internal and external technologies relevant to the firm, and associated characteristics. The organizational context refers to firm characteristics including strategies, policies, structure and cultural aspects. The environmental context refers to the external arena where the firm conducts its business. It includes the competitive, legal and regulatory atmosphere and the market in which a firm operates.

The Teo et al (2006) study concluded that organizational and technological inhibitors are more severe than environmental inhibitors in limiting the deployment of B2B e-commerce. While this study was able to identify and investigate a large number of inhibitors derived from the literature, it did not address the question of the possible relationship among different inhibitors, and what efforts some inhibitors may have on others.

The results of the case studies reported in Chapter 5 identify several inhibitors that limit the contributions that IT is able to make to the firms' competitive advantage. The results also make explicit the fact that inhibitors can be interrelated, as illustrated in Figures 5.4, 5.6 and 5.8. The highly interrelated nature of the inhibiting factors identified was emphasized by the fact that while different "clusters" of inhibitors were identified, in two of the three cases at least 60 percent of the inhibiting factors identified fell into a single cluster, while in the other case (Drugstore), 40 percent fell

into the largest cluster. The interrelated nature has implications for the way in which managers approach elimination of the inhibitors in practice.

The results also shed light on how inhibitors limit the contribution of IT to attainment of sustainable competitive advantage, within the RBV framework. Two main mechanisms were identified from the analysis:

- (a) Reducing the potential value of the individual resources and
- (b) Limiting the firm's ability to combine resources and capabilities in a way that would allow them to become rare, imperfectly imitable and non-substitutable.

The identification of the inhibitors and the mechanisms by which they limit the contribution of resources to competitive advantage helps further clarify the RBV. There have been calls for clarification of the mechanisms by which resources contribute to competitive advantage within the RBV. For example, in their critique of the RBV, Priem and Butler (2001a) pose the question "Why is it that some heterogeneous resources generate value, whereas other heterogeneous resources do not? (p. 33). Also, Eisenhardt and Martin (2000) point out that:

"Despite the significance of RBV, the perspective has not gone unchallenged. It has been called conceptually vague and tautological, with inattention to the mechanisms by which resources actually contribute to competitive advantage." (p. 1106)

The results of this study show that inhibitors within an organization determine the extent to which the value of IT resources can be realized, and whether valuable IT resources can be combined with other organizational resources to produce capabilities that are rare, imperfectly imitable and non-substitutable.

6.2.3 Relationship to External Environment

The Melville et al (2004) model from which the research model was derived, included two additional domains, in addition to the "focal firm" domain. These were:

- The "competitive environment" in which the focal firm operates. This was further separated into two components - industry characteristics and trading partners. Industry characteristics include competitiveness, regulation, technological change, clockspeed, and other factors that shape the way in which IT is applied within the focal firm to generate business value.
- The "macro environment" denoting "country- and meta-country specific factors that shape IT application for the improvement of organizational performance" (p. 297). Examples identified by Melville et al included government promotion and regulation of technology development and information industries, IT talent, and information infrastructure, as well as prevailing information and IT cultures.

As explained in Section 5.4.2.2, the research in Chapter 5 was conducted within the focal firm domain. Nonetheless, it is useful to examine how the other domains – the

“competitive environment” and the “macro environment” – which we will collectively refer to as the external environment, impacted on the inhibitors in the case studies.

In the Drugstore case, the Director pointed to the unavailability of persons who are skilled in both IT and retailing as part of the reason why IT was not being used more effectively. Also, the CEO pointed to the unavailability of persons locally with the specialized knowledge to do training that would allow the firm to take greater advantage of IT. In this instance, he was of the view that if the firm was located in a more developed country, this would not have been an inhibitor.

In the ABCGI case, the system selected proved unsuitable to the needs of the company. However, this system had been previously used in the UK Insurance market. This pointed to an internal inhibitor - the inability to pick the right system, as well as an inhibitor in the external environment - the unavailability of systems that were suitable for the local market.

In the Home Store case, the company instituted payment procedures that it admitted were cumbersome, because the management considered this necessary to protect against the risk of dishonoured payments. Thus, the need for these procedures, which proved to be an inhibitor, was driven by the legal and business environment in which the firm operated.

The above shows that the external environment can be a source of inhibitors. One implication of this observation is that efforts to improve firm-level use of IT by macro-level interventions in the “enabling environment” may be more effective if they target specific inhibitors that have been identified in this way. For example, in addition to programmes to develop skills in “complex deployment and utilization of ICT” as suggested by Infodev (2005), the Government of St Lucia may be well advised to consider development of skills in the management and application of ICT in specific sectors, such as retail. Also, the Government may wish to consider whether certain aspects of existing legislation should be amended to be more amenable to allow business to eliminate some cumbersome manual procedures.

6.2.4 Importance of the Technical IT Resources

There is wide support in the literature for the view that Technical IT Resources (TIR) by themselves are unlikely to be the source of sustained competitive advantage, because such resources are widely available and easily imitable (e.g. Barney et al, 2001; Mata et al, 1995; Powell and Dent-Micallef, 1997; Wade and Hulland, 2004). TIR are considered to be necessary but not sufficient for deriving competitive advantage from IT, and it is only the potentially unique combinations with other organizational resources that are likely to be a source of sustainable competitive advantage.

One consequence of this view however, is that it may have also led to an underestimation of the importance of Technical IT Resources. Such resources are increasingly considered to be commodity items (e.g. Carr, 2003) and there appears to

be progressively less emphasis on issues related to selecting, using and maintaining the TIR.

As the results of the study in Chapter 5 show however, the quality of IT resources are critical in determining the extent to which firms can derive competitive advantage from IT. In all three cases, inhibitors related to the TIR helped to reduce the contributions to competitiveness that the businesses were able to derive from IT. Also, in some cases where “technical problems” were encountered, not even the product vendor had been able to correct them.

This re-emphasizes the fact that having what Melville et al (2004) refer to as the “right IT” is still an important requirement for attaining or sustaining competitive advantage through IT. The ability to select the optimal TIR is an example of the *resource picking* ability – being better than rivals at selecting resources - that Makadok (2001b) identifies as one of the mechanisms that firms use to create economic rents.

In the case of ABCGI, the firm had selected a software application that was established in the more developed UK insurance market, yet the system had failed to meet ABCGI’s expectations. This points to a weakness in the firm’s resource picking ability. This outcome also lends support to Walsham’s (2001) argument that implicit assumptions about approaches to work and decision-making in the environment in which an information system is developed can affect its ability to be “appropriated” and adapted by users in other organizational, social and cultural contexts.

The above suggests that the issues surrounding the selection, deployment and maintenance of Technical IT Resources still require the attention of academic researchers and not just practitioners. This should also be of interest to ICT4D researchers as it further reinforces the argument that even if firms in the Caribbean or other developing countries can afford the same Technical IT Resources as firms in developed countries, it cannot be assumed that they will derive the same results from acquiring and using them.

6.3 Contributions to Theory

6.3.1 Importance of identification of inhibitors

The results of this research reinforce the importance of identifying and understanding inhibitors as an approach to studying various issues related to IT adoption and use. Early authors who explicitly used the concept of inhibitors (notably King and Teo, 1996), considered them only as the opposite or absence of *facilitators*. More recently some authors have articulated the need for recognizing and studying inhibitors as separate factors in their own right. (Cenfetelli and Benbasat, 2003; Cenfetelli, 2004; Teo et al, 2006). Cenfetelli (2004) has argued that inhibiting and enabling perceptions are independent and can coexist.

The research reported in this thesis adds to this small but important area of research and supports the arguments that separate identification of inhibitors is useful for developing a fuller understanding of what may prevent the implementation of IT, or prevent firms from deriving the expected benefits of IT. Many of the inhibitors reported in the study are unlikely to have been identified merely by looking for the presence or absence of facilitators.

The results further extend this area of research by showing that contrary to the typical presentation of inhibitors in the existing literature as discrete factors, they can in fact be highly interrelated factors that act upon each other in cause-and-effect relationships, forming networks and clusters. By making inhibitors and their interrelationships explicit, our ability to explain their effects and identify methods of eliminating them will be considerably improved.

6.3.2 Further Clarification of the RBV and Relevance to Managers

The research has helped to address some gaps that still exist in the body of literature that has built up around the RBV. Despite the popularity of the RBV, it has been subjected to many criticisms, including “inattention to the mechanisms by which resources actually contribute to competitive advantage” (Eisenhardt and Martin, 2000) and failure to provide effective prescription for managers (Priem and Butler, 2001a, 2001b). Priem and Butler (2001a) also pointed to the need for further explanation of why some heterogeneous resources generate value and others do not.

As stated earlier, the identification of the inhibitors and the mechanisms by which they limit the contribution of resources to competitive advantage helps further clarify the RBV. The study illustrated how inhibitors undermine the attributes identified by the RBV as being necessary for deriving sustained competitive advantage from IT. This included reducing the value that can be realized from available resources and limiting the organizations ability to combine resources in ways that would enhance the “VRIN” attributes.

Further, in the debate between Priem and Butler (2001a, 200b) v Barney (2001) on the usefulness of RBV as a theory, one of Priem and Butler's criticisms on which the two sides agreed was that the RBV in its current form did not provide effective prescription for practitioners. Priem and Butler (2001a) state that

“...[I]f RBV were a theory that was descriptively accurate and that generated prescriptions for strategy practitioners, it would not be operationally valid unless it was also practicable for managers to manipulate the key independent variables. Simply advising practitioners to obtain rare and valuable resources in order to achieve competitive advantage and, further, that those resources should be hard to imitate and nonsubstitutable for sustainable advantage, does not meet the operational validity criterion.” (p. 31).

Barney (2001) agreed that the attributes of resources that make them likely to be sources of “sustained strategic advantage” were “not amenable to managerial manipulation” (p. 49). He however countered that this “does not imply that resource-

based logic has no managerial implications". Among specific examples of practical managerial implications offered by Barney was that:

"Resource-based logic can also be used to help managers in firms that have the potential for gaining sustained strategic advantages, but where that potential is not being fully realized, to more fully realize that potential." (p. 49).

This research has helped to address the above concern by offering a means of bridging the gap between the RBV's assertions, and managerial action. Identification of inhibitors will allow managers to identify instances where the potential for gaining sustained competitive advantage is not being realized. Once these inhibitors have been identified, managers will then be in a position to take action to eliminate the inhibitors or reduce their severity.

6.3.3 Understanding IT Management and Use at the firm level in the Caribbean

Despite the strong advocacy for greater use of IT by Caribbean firms, there is a paucity of empirical data on firm-level IT use within the Caribbean. Within the ICT4D literature stream, there is also relatively little research that is specific to Caribbean countries, compared to other developing countries. Given the arguments about the importance of context that have been advanced by some authors (e.g. Avgerou, 2001; Walsham, 2001), it is necessary to develop a body of firm-level research that is specific to the Caribbean to allow assessment of the extent to which the assertions of the "IT value" and ICT4D streams, derived from other contexts, are supported within the Caribbean context.

This study contributes to both of the above streams by providing an initial insight into IT adoption and use in a Caribbean firm, that can become part of an accumulation of knowledge of IT in that context. It also shows that through explicit identification of inhibitors, it is possible to make a direct connection between the "enabling environment" for IT use, and firm-level use of IT.

6.4 Contributions to Practice

6.4.1 Identification of Inhibitors as a Diagnostic tool

The process used to identify the inhibitors in this study provides a basis for development of a diagnostic tool that will increase the practical value of the RBV for managers. As discussed earlier, the lack of prescription for practitioners has been identified as one of the shortcomings of the RBV.

While the process is grounded in theory, it allows for a high level of engagement with the management of the firm and can be used as a participatory process that will help secure management "buy-in". The causal networks derived from the process provide a graphical representation of the collective views of the managers. Further, the process draws on techniques (particularly Root Cause Analysis) from the Quality Management domain, that are already familiar to many practitioners.

This process offers the potential to be developed into a diagnostic tool for identifying ways to derive greater competitive benefit from existing IT or from new IT investments. Further, the “disaggregation” of the inhibiting factors not only allows root causes of the problems to be identified, but also provides a basis for determining what aspects of IS research and practice are most relevant to solving the problems.

6.4.2 Empirical basis for Government IT interventions in Private Sector

As was explained in Chapter 2, some governments in the Caribbean have been sufficiently persuaded about the potential of IT to contribute to the competitiveness of their economies, that they have committed financial resources towards accelerating IT adoption and use at the national level. This is being done despite the limited availability of empirical data on IT use in the private sector in the Caribbean.

This study, while limited in scope, provides an initial insight into how some private sector firms use IT, and adds to the limited base of empirical data currently available. It can also be used as the basis for further investigation, as discussed under “Opportunities for Further Research” below. Further, by identifying inhibitors that prevent firms from using IT to generate competitive advantage, and illustrating how these inhibitors are related to the external environment, the study provides an empirical basis for determining specific actions that should be taken by governments to strengthen the “enabling environment” for IT adoption and use.

6.5 Limitations of the Research

The main limitation of this study is that like other case studies, it faces the issue of generalizability. While the use of explicit theoretical criteria for case selection as per Eisenhardt’s (1989) guidelines improves the chances of generalizability, the 3 business units within the same firm constitute a unique set of circumstances. This limitation can be overcome however, by repeating a similarly designed study in other firms meeting the theoretical criteria.

A second limitation of this research is the absence of financial data to be used as “objective” measures of value, or as a means of triangulating the interview data. While the views of the managers provided a good alternative basis for determining the benefits derived from IT, a more thorough analysis, and one which would be better able to explore alternative explanations, would have been possible if financial data was available.

6.6 Opportunities for Further Research

The limitations of the research, particularly with regard to the generalizability, can be overcome with further research. One of the main opportunities is to use the inhibitors identified in this study as the basis of an instrument for a broader investigation of

inhibitors in other types of Caribbean firms. Such research can also be used as the basis for designing a practitioner tool for diagnosing inhibitors to IT use in firms, and identifying opportunities for overcoming them.

Another opportunity is to carry out a comparative study among competing firms. The focus of the research in this thesis has been on the contribution of IT to competitiveness. In Project 2, the managers made a number of assertions about their competitive positions vis-à-vis competitors. For example, the General Manager of Home Store believed that Home Store's use of IT had given it a competitive advantage, but that if the competitors had "done as good a job" in implementing and using IT, they would be much more competitive against Home Store. A study that compares what each competitor sees as the contribution of IT to its relative advantages and disadvantages to other competitors will provide an opportunity to validate findings about the inhibitors and contributions.

While the analysis presented in this thesis addresses how inhibitors weaken the VRIN attributes of IT-related resources and reduce their potential contribution to achieving sustained competitive advantage, there is an opportunity to investigate the weakening mechanisms in greater depth. For example, a more in-depth investigation of the "severity" of each inhibitor – how much of an impact each inhibitor has (Teo et al, 2006) would allow for greater guidance on where management efforts should be focused.

6.7 Conclusions

This thesis reported on research to investigate the use of IT by Caribbean firms to assist in improving competitiveness. The research was structured around 2 research questions, the answers to which have been explored in detail. I conclude by summarizing the answers as derived from the research:

Question 1: How are private sector Caribbean firms using Information Technology (IT) to assist in surviving the increasingly competitive business climate?

The firms participating in this research were all using IT, and considered it critical to their operations. The management of the firms also believed that IT would assist them in becoming more competitive and enable them to cope with the perceived increase in competition.

The results showed however, that most of the firms were primarily using IT to improve the operational efficiency, with only limited application of their IT resources towards the strategies that they considered necessary to respond to the increasing competition. Given the firms' investments in IT, the results suggest that the firms are underutilizing their IT and are missing opportunities to derive competitive advantage from their IT resources.

Question 2: What are the firm-specific factors limiting the contribution that IT can make to the competitiveness of the firms?

Several *inhibitors* were identified as limiting the extent to which IT could contribute to the firm's competitiveness and achievement of sustainable competitive advantage. The inhibitors fell into the following categories:

- Technical IT Problems.
- Inadequate Functionality.
- Underutilization of available IT.
- Inadequate IT/Business skills.
- Weak IT/Business alignment.

These inhibitors reduced the value the firm was able to derive from IT-related resources, and also limited the firm's ability to combine its IT resources with other firm resources in a way that could provide sustainable competitive advantage. The results also showed that the inhibitors were highly interrelated, forming networks and clusters.

The results show that the reasons Caribbean firms are not deriving the level of benefit expected from IT may be more complex than they may initially appear. This implies that Caribbean governments or other institutions who wish to use IT as a tool for national development need to assist in or encourage the development of management skills and approaches that can address the multiple inhibitors limiting IT contributions.

6.8 Chapter Summary

This chapter described the key findings of the research, which were derived from synthesis of the results of the individual projects and the relevant literature. It showed that the research contributed to both the RBV and ICT4D literature streams, as well as extending a small but important branch of literature that investigates inhibitors to IT adoption and use.

The research also contributes to practice by providing a theoretically grounded and empirically derived basis for a diagnostic tool to identify actions that firms can take to obtain greater competitive benefits from IT.

In the next chapter I will share some reflections on the process of conducting the research, and how this has helped my personal development.

CHAPTER 7: THE RESEARCH EXPERIENCE

In this chapter, I return to the question posed by James and Vinnecombe (2002) that I referred to in Section 3.3.4 - "Does the personal involvement of the researcher in the subject of the research matter?" In Section 3.3.4, I addressed the question from the perspective as a researcher. In this Chapter I address it from the perspective of an individual. There were a number of experiences that made this research programme a sometimes difficult undertaking. Nonetheless, it enabled me to further develop my academic and professional skills.

7.1 The role of Consultant vs Researcher

One of the main challenges of the experience was balancing the roles of part-time researcher with that of full-time consultant. The issue was not merely one of allocating time to those roles, put perhaps more critically, of being able to adopt different perspectives of the same situation.

It emerged very early during the research process that "research" produced by professional management consultants was regarded with some disdain by academic researchers. There was both anecdotal evidence and literature that supported this view. For example, the statement that one's research read "like a consultant's report" was an indication that it did not meet the standards of academic work. Also, Mumford's (2001) statement that "the academic researcher, in contrast is, ideally, dedicated to the pursuit of knowledge in an ethical manner" (p. 15), when comparing academic research to consultancy, certainly creates an impression that the consultant is either not dedicated to the pursuit of knowledge or does not do it in an ethical manner.

As my formal research skills developed, I attempted to apply those skills to my consulting practice. This had some positive effects, but it also created some difficulties. For example, attempting to apply the rigorous standards of academic research to consulting assignments meant ignoring "weaker" sources of data, such as anecdotal evidence, that could not be substantiated. In the case of one client however, this led to accusations of not recognizing "what everyone already knows" and "having one's head in the sand". The fact that something was not proven did not mean it was not true.

The other side of the transition was that since I conducted the academic research in an organization with which I was already familiar, there was a lot of history, beliefs and folklore that I was already aware of, which may well have shed light on the situations being investigated. However, as I explained in Chapter 3, I used my prior knowledge to assist in investigating and asking the right questions, rather than imposing my own answers.

7.2 The nature of the academic endeavour

The other major challenge was the nature of a Doctoral research programme itself. While at the time of starting the programme I had some fairly clear ideas of what I wanted to investigate and the nature of the discoveries I hoped to make, this changed as the programme progressed. Doctoral research requires considerable attention to detail and a focus on a very narrow area. At times however, it appeared that I was chasing a moving target, as the narrow target seemed to shift, for various reasons, as the research progressed.

The need to focus conflicted with the need to divide my attention between the DBA programme on one hand, and growing a small business on the other. The challenge, to which I was finally able to rise, was to accept that in order to achieve my goal of completing the DBA, there would be some temporary consequences for the business.

7.3 Personal Development

The contributions of my research to theory and practice are stated in Chapter 6. Perhaps an additional type of contribution that can be stated is a contribution to Personal Development. These are (a) appreciating the value that a diversity of perspectives, considered in their proper context, can bring, even in a profession where one is expected to provide single straightforward answers (b) accepting the importance of collecting and critically evaluating evidence, even when one is familiar with the situation and (c) the importance of committing oneself to an endeavour and pursuing it to completion despite numerous obstacles.

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APPENDIX A: LIST OF CARIBBEAN COUNTRIES

Population and Gross Domestic Product (GDP) of Caribbean countries in 2005

Country	Mid Year Population 2005 (000s)	GDP at Current Prices 2005 (USD \$m)	Per capita GDP at Current Prices 2005 (USD \$m)
Antigua and Barbuda	82.8	870.3	10,513
The Bahamas	320.7	6,090.2	18,990
Barbados	273.0	3,061.2	11,213
Belize	291.8	1,110.9	3,807
Dominica	70.6	300.3	4,251
Grenada	105.9	503.9	4,758
Guyana	757.6	825.6	1,091
Jamaica	2,660.7	9,665.0	3,633
Montserrat	4.8	44.0	9,189
St Kitts and Nevis	49.3	428.7	8,696
Saint Lucia	164.2	882.4	5,374
St Vincent and the Grenadines	104.9	430.4	4,101
Trinidad and Tobago	1,294.5	14,357.9	11,092

Source: Compiled from data provided by Caribbean Development Bank Annual Economic Review 2006 (Caribbean Development Bank, 2006a)

Note:

- Both GDP and Per Capita GDP are stated at Current Prices
- Monetary amounts above stated in United States Dollars. Source document states monetary amounts in countries' national currencies. Conversion to US Dollars done using "Average Exchange Rate" provided for each country in the report
- The following countries are also members of the Organization of Eastern Caribbean States (OECS) – Antigua and Barbuda, Dominica, Grenada, Montserrat, St Kitts and Nevis, Saint Lucia, St Vincent and the Grenadines

APPENDIX B: CONTRIBUTION TO GDP BY SECTOR FOR ST LUCIA

Sectors	2000	2001	2002	2003	2004	2005	2006
Agriculture, Livestock, Forestry, Fishing	6.92	5.43	5.62	4.60	4.28	3.08	3.20
Mining and Quarrying	0.62	0.48	0.49	0.47	0.44	0.41	0.46
Manufacturing	8.08	8.13	8.85	8.70	9.42	6.75	6.83
Construction	8.45	8.34	7.87	7.77	7.50	8.07	8.67
Electricity and Water	4.95	5.38	5.20	5.15	5.02	4.15	4.54
Wholesale and Retail Trade	11.84	10.51	10.56	11.05	11.46	11.69	11.12
Hotels and Restaurants	12.61	11.72	11.56	13.10	13.26	13.48	12.44
Transport	10.31	10.57	10.08	10.02	10.34	10.51	10.44
Communications	8.73	10.15	10.82	10.99	10.99	11.28	10.68
Financial Intermediation (Banking and Insurance)	10.09	10.75	10.80	10.70	10.74	11.16	11.54
Real Estate and Owner Occupied Dwellings	11.46	12.31	12.50	12.55	12.39	12.52	12.19
Producers of Government Services	11.83	12.58	12.28	11.68	11.63	12.04	12.55
Other Services	4.67	4.49	4.53	4.40	4.24	4.13	4.70
Less imputed Banking Service Charge	-8.44	-8.94	-9.04	-8.92	-8.94	-9.18	-9.73
Total	100%	100%	100%	100%	100%	100%	100%

Source: St Lucia Economic and Social Review 2006 (Government of Saint Lucia, 2006)

APPENDIX C: DATA COLLECTION PROTOCOL FOR PROJECT 1

Part I – Background Information

The purpose of the questions in this section is to elicit relevant background information about the target firms and interviewees. Most of the questions are factual in nature in many cases the answers can be obtained outside the interview from published documents and other sources.

Main Items

- Name of firm
- Division/Unit/Dept (if relevant)
- Name of Interviewee
- Position/Title
- Time with firm
- Time in position
- Age of firm (or business unit which interview refers to)
- Main types of business
- Main places of business
- Type of firm
- Ownership
- Percentage of Caribbean ownership
- Have there been ownership changes between Caribbean and non-Caribbean owners within the last 10 years? If so, what?

Part II – Interviews

The interview questions will largely be open-ended and the specific phrasing and order of questions will depend on the actual flow of the discussion. The

a. Competitive environment

Discussions on this topic will elicit how the respondents perceive the competitive environment in which their firms operate and the types of strategies and actions required to respond. Key areas to be addressed include:

- Who (what types of businesses, where, etc) do they consider as their main competitors and why?
- To what extent do they perceive the nature of competition to be changing and why?
- To what extent do they believe there is an increased threat from foreign competitors
- What they consider to be the key strategies needed to respond to changes in the competitive environment

b. Competitive Strategy and the Role of IT

This will include discussion on how respondents perceive the actual and potential role of IT in their firms' competitive strategy and will address topics such as:

- Whether there is a formally articulated competitive strategy and its main features
- How IT fits into the competitive strategy
- The respondents' views on how IT is or is not contributing to the firm's competitiveness and why
- What conditions would allow IT to make a better contribution to the competitive position

c. IT Capability and Experience

This section is intended to elicit more specific information on how the firm is using IT including experiences to date. Key points to be covered include:

- Extent to which IT is being used within the firm
- Type of applications and systems in place
- IT spending
- Key projects and their results
- Attitudes of Management and Staff

d. Other relevant issues

Questions under this heading are intended to solicit other information which the respondents may consider relevant to the subject of the interview. Examples would be the effect of other environmental factors such as government policies and availability of suitably skilled personnel.

APPENDIX D: DATA COLLECTION PROTOCOL – PROJECT 2

1. Competitive Environment

	Item	Key questions/ issues
1.1	Sources of Competition	Who/ what do you consider to be your main competitors? Why? How do they compete with you?
1.2	Changes in Competition	Where are they located?
1.3	Regional and International Context factors	Are the competitors identified best described as (a) new threats (b) threats that previously existed, but have changed or (c) there that previously existed and are the same as before?
1.4	Technology effects	
1.6	Comparison of IT to competitors	In what ways if any, do you believe that the use of technology, and IT in particular, has affected the competitive environment?
1.7	Sources of competitors' advantage	Do you believe that your use of IT, compared to that of your competitors makes a difference to your competitive position? If so, how? What do you believe are the advantages of your competitors? Why do they have these advantages?

2. Competitive Position and Response

	Item	Key Questions/ Issues
2.1	Sources of competitive advantage	What do you consider to be your main advantages over your competitors? How are these advantages derived?
2.2	Competitive responses	
2.3	Business and IT Strategy	<p>Does IT contribute to creating an advantage, and if so, how?</p> <p>What do you believe the firm/ business unit needs to do to ensure that it is able to respond to the competitive threats?</p> <p>What actions are required to ensure that the firm can pursue its competitive strategy.</p> <p>Does the firm/ business unit have a documented business strategy?</p> <p>Does it have a documented IT strategy? To what extent are the business and IT strategies influenced by each other?</p>

3. Internal Factors

	Item	Key questions/ issues
3.1	Resources	<p>Views on the adequacy of the level of investment in IT. Views on the adequacy the IT resources available. Whether availability of resources to support IT has constrained any desired activities or has encouraged use of IT where it may not have otherwise been used.</p> <p>How would you categorise the attitude of management towards the use of IT? How has the attitude of management towards IT helped or hindered the successful use of IT? To enquire about attitude of management at operational/business unit level and at senior level.</p> <p>How would you categorise the attitude of non-management staff towards the use of IT? How have these attitudes towards IT helped or hindered the successful use of IT? How would you describe the service you get from the IT service providers? How capable would you say the firm is in selecting, deploying, managing and using IT? How does this affect the business?</p> <p>Is there any aspect of the structure of the organization that helps or hinders ability to use IT in the way you think is should applied? How do you see the MIS (IT) Department relating to the business? How does this help or hinder the ability of the MIS Department to do a satisfactory job?</p> <p>Are there significant differences in the ages of your staff? Do these age differences make a difference to the way in which IT is managed and used in the business? How does the age of staff members affect the way in which IT is used? Where do you believe the initiative comes from for IT projects? Who has been most influential in the decisions that have been taken about IT activities?</p>
3.2	Management attitudes	
3.3	Staff attitudes	
3.4	IT Competencies (technical and non-technical)	
3.5	Organizational structure	
3.6	Effects of age	
3.7	Sources of IT impetus	

4. IT-Specific factors

	Item	Key questions/ issues
4.1	How IT developed over time	<p>When did the company/business unit first computerise its operation? What aspects were computerised when? How did the level of computerisation develop over time?</p> <p>What are the arrangements in place for managing IT?</p> <p>Who makes decisions about IT selection, acquisition, deployment, use and support?</p> <p>What is the process by which IT is deployed for use?</p> <p>What action has been taken to ensure that management and staff are able to make effect use of the IT resources available? How are staff trained to use IT?</p> <p>What are the range of activities currently supported by IT? To what extent are they supported? What proportion of staff have access to IT for their work?</p> <p>What are the various IT-based applications available to the firm/business unit? What specific activities do they support?</p>
4.2	How IT managed	
4.3	How IT Deployed	
4.4	Staff training (technical and non-technical staff)	
4.5	IT applications available	
4.6	Extent of IT use	

5. IT Role and Expectations

	Item	Key questions/ issues
5.1	Expectations from IT	<p>What benefits do you expect IT to bring to your firm? Are there specific ways that you expect IT to contribute to the competitiveness?</p> <p>What is the role of IT within the firm/business unit? In particular, what role is IT expected to play in making the firm competitive or responding to competitive threats?</p> <p>What action has the firm/ business unit undertaken to improve the level of benefit derived from IT?</p> <p>What has been the result of this action? What else do you believe needs to be done in that regard?</p> <p>What are the specific benefits you believe that the firm/ business unit has derived from the use of IT? How have these benefits been manifested?</p> <p>Are there specific benefits that you believe the firm could derive from its use of IT, but is not yet deriving?</p> <p>If so, what are these benefits? Why is the firm not currently deriving them?</p> <p>What needs to be done to realise those benefits?</p>
5.2	Role of IT	
5.3	Improving benefits of IT	
5.4	Benefits derived from IT	
5.5	Potential and unrealized benefits	

6. IT Experiences

	Item	Key questions/ issues
6.1	Experience with IT to date	How successful would you consider your implementation and use of various IT systems to be?
6.2	IT successes	<p>What are the specific reasons why some are considered successful?</p> <p>What are the specific reasons some are considered unsuccessful?</p> <p>What else can you say about your experience with IT within the firm/business unit to date? Has there been any other aspect of the experience – whether positive or negative, that has stood out?</p> <p>Are there specific successes that stand out?</p> <p>Are there specific failures or disappointments that stand out?</p>
6.3	IT difficulties	

7. IT and environment

	Item	Key questions/ issues
7.1	Consumer behaviour	<p>Are you aware of any changes in the behaviour and expectations of consumers that have affected your competitive position?</p> <p>How does the public perceive your use of IT? As far as you are aware, does the public's perception (of your IT use) make a difference to your competitive position?</p> <p>Has the availability of external support affected the manner or extent to which you have used IT? If so, how? Are there specific actions that you have avoided because of a lack of external support, or are there specific activities where the decision to undertake them was influenced by the availability of external support?</p> <p>Are there any actions taken by the government that you consider to have affected your use of IT? What are these? How have they affected your IT use, and why?</p>
7.2	Availability of external support	
7.3	Government Policy and action	
7.4	Public perceptions and expectations	

APPENDIX E: DATA COLLECTION PROTOCOL FOR PROJECT 3

Initial List of Inhibitors For Drugstore used during P3 interviews

	Inhibitor	Description	Causes/ Effects
1	System use not optimized	Managers were not fully utilizing available IT system. Applied particularly to underutilization of information available from system.	
2	Unresolved technical problems	Some technical problems had persisted since deployment of INVENSYS. Specific technical problems identified that caused delays in availability of correct information.	
3	IT Department and Vendor unable to resolve Technical problems	Some technical problems persisted as indicated in (2) above because the IT Department and the system Vendor did not know how to resolve them.	
4	Need to use manual methods to get required information from the system	It was sometimes necessary to use manual methods, such as combining data from multiple reports, to obtain information required from the system. This led to “excessive work”.	
5	Floor staff not making adequate use of available IT	Some floor staff in the stores did not use the IT system to monitor shelf inventory, leading to occasional “stock outs”.	
6	Limited availability of “access points” for floor staff	The number of access points available for use by floor staff was limited, contributing to the problem of inadequate use mentioned in (5) above	
7	Lack of interface to the Accounting system	Absence of an interface between INVENSYS and the Accounting system caused additional manual work to transfer data from one system to another. It also led to inaccuracies in the accounting data, and the need to spend additional time on identifying and correcting errors resulting from this.	

	Inhibitor	Description	Causes/ Effects
8	Duplicate and incomplete inventory data	The existence of duplicate item codes made it difficult to determine correct sales figures for the affected items. Absence of barcodes on some items increased checkout time because cashiers had to perform time consuming searches.	
9	Inadequate detail on customer buying patterns	Lack of detailed information on the buying patterns of individual customers reduced Drugstore's ability to anticipate changes in customer tastes. Although INVENSYS could support a Customer Loyalty Program, Drugstore was not using that functionality.	
10	Inadequate spending on training	Drugstore was not spending enough on IT training and this contributed to users not making adequate use of the available IT. This despite the fact that the firm was not facing financial constraints.	
11	Insufficient impetus for improving IT use from within Drugstore	Insufficient impetus coming from Drugstore management team to take advantage of IT.	
12	Absence of specialist in-house IT skill	Drugstore did not have anyone in-house who had the skills to focus on how to derive greater advantage from IT. The managers considered this to be partly responsible for Drugstore not taking greater advantage of IT.	
13	Weak "middle management"	Because middle management was considered "weak" senior management had to spend more time on day-to-day matters. According to the Director this left senior management with inadequate time to develop IT skills. Also, business unit managers were not making demands for more information, and were not holding subordinate staff accountable for underutilization of available IT resources.	

	Inhibitor	Description	Causes/ Effects
14	Lack of business-specific knowledge in IT Department	The extent to which the IT Department could assist the business unit in taking advantage of IT was limited by lack of knowledge of Drugstore's business within the IT Department	

Initial List of Inhibitors For Home Store used during P3 interviews

	Inhibitor	Description	Cause/ Effects
1	Slow customer checkout speed	Slow speed at checkout caused customers to be “waiting around” at the checkout and caused dissatisfaction. Was partly due to system performance problem.	
2	Delays in making goods available for sale	Difficulties with the Customs Brokerage program caused delays in calculating the Landed Cost and setting prices for items received. This delayed their availability for sale and resulted in lost revenue opportunities.	
3	Database and network performance problems slowing operations	Technical problems caused by the network infrastructure and database software reduced performance of the application from time to time. This contributed to the problem of slow checkout speed.	
4	Staff not making use of available feature	Staff at all levels were not making full use of the available features of the system. This was partly due to a lack of training.	
5	Technical problems that users cannot solve	Users were only able to solve a few of the technical problems encountered during day-to-day operations. When other problems occurred, they had to wait for assistance from IT Department, sometimes slowing down customer service.	
6	Inadequate staff training	Staff did not receive adequate training in the use of the software, and this contributed to underutilization. While training was provided to the supervisors, this was not passed on adequately.	

Initial List of Inhibitors For Home Store used during P3 interviews

	Inhibitor	Description	Causes/ Effect
1	Technical System Problems	Technical problems with the INSURSYS software were identified as a major reason why the system was not currently meeting expectations. Problems identified included problems printing reports, errors in reports, and incorrect data in (database) tables. Several other inhibitors appeared to be related to these technical problems.	
2	Inadequate accounting functionality and integration	The absence on accounting functionality within INSURSYS made it necessary to re-key transaction information into the accounting system. It also gave rise to errors and discrepancies between customer information in INSURSYS and the corresponding information in the accounting system. Additional time had to be spent correcting these discrepancies. The lack of accounting functionality was due to a deliberate decision by management.	
3	Desire to save on system cost	Decisions were taken not to purchase optional modules in order to save costs. This included the integrated accounting feature and the Automatic Renewals feature. These decisions led to some of the shortcomings reported.	
4	Senior management skepticism about application	Senior management (at Group level) were not satisfied that the system was providing the expected results thus far, and did not have great confidence in it. One of the consequences was that they were not able to make the expected use of information from the system to support their decision-making.	

	Inhibitor	Description	Causes/ Effect
5	User expectations to great	Users had high expectations of what the system should be able to do. The GM was of the view that these expectations were too great. As the system was not able to meet expectations, users lost confidence.	
6	Desire for new system to function as old system did	Users expected the new system to behave in the same way and provide the same functionality as the one it replaced. The fact that it didn't led to some disappointment. The new system (INSURSYS) did not offer as much flexibility in executing queries as the system that it replaced.	
7	Inadequate planning of implementation	AM argued that it was not possible for management to fully plan the implementation and take account of "all the different types of scenarios". However, the lack of planning led to inadequate evaluation of the "Reinsurace" feature, which later proved to be unsatisfactory..	
8	Duplication of work through retention of manual systems	Staff maintained manual versions of records that were already being maintained by the system, because they did not fully trust the system. This led to duplication of work.	

	Inhibitor	Description	Causes/ Effect
9	Increased length of time to serve customers	Introduction of INSURSYS caused increases in the length of time taken to serve customers. One reason was that it corresponded to the starting of a new company that required that existing customers complete new proposal forms. Another was that frequent system problems led to delays in serving customers. Also, due to users' lack of confidence in correctness of system output, much time was spent rechecking documents for correctness. These problems led to customer frustration.	
10	Inadequate reporting capabilities	The system was not providing the information and reports expected. In some cases the reports it provided were not suitable to the requirements of the firm. In other cases, the information on the reports were incorrect.	
11	Inadequate system controls	Inadequate system controls in INSURSYS allowed users to enter incorrect data or perform incorrect system actions. This led to incorrect system information, and incorrect output in reports.	

APPENDIX F: DETAILED ANALYSIS OF PROJECT 1 INTERVIEWS

F.1 Introduction

This section presents the analysis of the interviews conducted as part of Project 1. The analysis was based on the analytical framework developed for the research, and described in Chapter 4.

F.2 Firm A – Interview with Head of Government Services

F.2.1 Background

Firm A is an Information Technology services company. The interviewee described himself as being responsible for the firm's Government market within the Barbados office. He had been with the firm for 2 years at the time of the interview, in that position.

The firm, which has been in the IT business for many years, was recently restructured to integrate the various IT-related business units of its parent company. This included a total of 7 companies operating in 5 Caribbean territories. The parent company, which owns approximately 80% of Firm A, is a relatively large Caribbean conglomerate with headquarters in Trinidad and Tobago and operations in several other Caribbean territories.

According to interviewee, the firm has a staff of approximately 600 and is his view, that possibly made it the largest Caribbean-based IT vendor. (This represents the total for the firm, not just the Barbados office). It currently uses a matrix structure with the vertical components representing specific market segments such a Government, Financial Services, Hospitality and Utilities, and horizontal segments representing specific technologies and applications such as Geographic Information Systems (GIS) and Education systems.

The firm offers a range of IT products and services, including computer hardware, software, telecommunications equipment and related services. It represents several international brands including Compaq, Microsoft, Oracle, Motorola and Avaya. According to the firm's website, its vision is "to be the leading Caribbean-based provider of Information and Communications Technology and Services solutions Worldwide".

F.2.2 Internal Context

F.2.2.1 Management attitudes

The interviewee reported that management was very supportive of the use of IT and suggested that they took a lead role in encouraging IT implementation by stating "we look to management for example in terms of the way forward". This was consistent with the generally positive views of IT expressed during the interview. However, he

did not elaborate on how the supportive attitude manifested itself or offer any concrete examples to illustrate the management attitude.

F.2.2.2 IT Competencies

The firm's level of IT competence emerged as a significant factor influencing its use of IT, particularly because it was an IT vendor. The interviewee emphasized this point by stating:

“One of the things that we are very privileged to do, being in a very privileged position, is that we are able to work with our partners and our suppliers in this regard and be able to have first hand knowledge as to what are the products and services that they offer. As a process of our overall business objective we evaluate whatever we offer to our client and we are a little step ahead if you will in terms of what is out there in what we need to do to keep ahead of the game but at the same time we don't only just look at best practice as something that is necessary but we look in addition as to how it will fit within our organisation because best practice, as far as we are concerned, there is no competitive advantage in best practice if every body has it. We look to see how it fits within the organisation that we are in and how we can be able to leverage whatever it is to our own advantage using our own unique skills and so on.”

In this regard, IT competence may be considered to be one of the firm's key resources, and one that it enhanced by the nature of its relationship with its suppliers and business partners. The interviewee also indicated that the firm also attempts to bring all of its employees “up to a particular level of competence” in IT for day-to-day use of available systems.

F.2.2.3 Organizational Structure

One of the key characteristics of the firm's structure is the regional nature of its operations, with its presence in several Caribbean territories. It also operated in several market sectors including government, financial, hospitality, utilities and mining using a matrix structure with the vertical axis representing particular sectors and the horizontal axis representing specific classes of technologies or applications, such as Geographical Information Systems and education applications.

The structure of the firm, particularly with regard to the geographical scope of operations and its size, appears to be a significant factor in its competitive positioning, in that it perceives its main competitors to be the few firms that have similar geographical reach and are of comparable size.

F.2.2.4 Sources of Competitive Advantage

The interviewee saw the firm's unique way of doing business as one of its main sources of competitive advantage. He explained that the firm had been able to “build up a particular way of doing things” which he felt was “something that is not easily copied” as it was “something that we have really built from within”.

The interviewee also believed that the firm's physical presence in the Caribbean offered an advantage over those competitors who didn't have such a presence. He illustrated this using the example of Dell:

“Using the example of Dell, Dell has been successful simply because they have a particular model that appeals to certain categories of people but this is not an appeal that is shared by everyone. There are some people who believe that they need a person who is on the ground who can be able to support them, whenever they pick up a phone and call they can be able and get service at the same time whenever they have an issue.”

The advantage of its physical presence is further enhanced by the geographical scale of its operations and the length of time it had been in operations.

It can also be deduced from the discussions that the firm's representation of and relationship with and representation of high-profile IT suppliers and service providers such as Microsoft and Oracle contributes to its competitive position. This is particularly so, given the firm's policy, as articulated by the interviewee, of ensuring that it continued to improve its competence from "technology transfer" when it implemented projects with partners from outside the Caribbean.

F.2.2.5 Expectations from IT

The interviewee's responses revealed high expectations of the potential of IT to contribute to the firm. Specific expectations cited included improvements in efficiency, improvements in customer service and the ability to respond more quickly to competitive situations. His discussion of these expectations suggested that he had great confidence in the ability of IT to deliver those benefits.

F.2.2.6 Attitude of non-management staff towards IT

The interviewee commented on the attitude of management and staff towards IT in general, and did not comment specifically on the attitudes on non-management staff. The overall impression given was that there was generally positive and supportive attitude towards the use of IT. This conclusion seems consistent with points raised elsewhere in the discussion, for example the apparent high levels of access to computers by staff and the extent of IT use within the firm.

F.2.2.7 Source of IT impetus

The interviewee painted a picture of an idealized situation where business strategy is developed for the firm by top management and the strategy for IT use (to support the firm's operations – as opposed to IT provided as a service), is derived from that. He also suggested that while the process was "top-down driven", there was consultation from various levels within the firm.

He did not however offer specific indications of which individuals within the firm

were most influential in determining the firm's use of IT or how decisions were arrived at with regard to IT use.

F.2.3 External Context

F.2.3.1 Sources of Competition

The primary sources of competition identified by the interviewee were relatively large non-Caribbean firms who were able to operate on a regional basis. According to him:

“... we believe that ... well there are number of players within the market ... our traditional players ... up to this point would be people like IBM, people like ICL, Cable & Wireless to a certain extent ... those are really the traditional players that are in our market who are present within the Caribbean. Notice that I am not talking just individually in terms of islands but I am talking collectively as regional companies. These persons have various structures that they have in place to be able to carve into the regional market as well. So basically, we see those as the major players within the Caribbean presently, who have strong bases within the Caribbean.”

As indicated, it appeared that the most significant issue seemed to be the ability of these firms to compete on the same geographical scope as Firm A. It should be pointed out however, that these firms are also known to compete in several of the vertical markets identified earlier by the interviewee.

The interviewee also acknowledged that in addition to the “traditional” players mentioned above, more recent entrants from outside the region who did not have an established base in the Caribbean had become a threat but did not seem to consider them as significant as the traditional competitors. He did not give any indication that he considered other local firms to be significant competitors.

F.2.3.2 Changes in Competition

The most significant competition identified by the interviewee came from traditional competitors. He did allude however, to certain changes in the competitive environment, particularly with regard to non-Caribbean competitors, that were becoming more significant. In particular, he identified the case of 2 non-Caribbean competitors who were recently competed against his firm for a large contract related to an educational IT project in Barbados. According to him, these companies were not previously “players” in the region, and he explained this new interest by stating:

“... with the Caribbean now starting to look very seriously at technology, they are now attracting the attention of companies who would not have previously thought of coming to the Caribbean simply because they thought the markets were small and insignificant”

Thus the perceived development of IT within region and the consequent expansion of the IT market was seen as attracting more competition.

F.2.3.3 Competitors' Advantages

Access to better technology was seen as an advantage that some competitors' had, but only to a limited extent. Further, the interviewee felt this was diminishing, particularly as his firm had adopted an approach of structuring its partnerships with non-Caribbean firms in a manner that allowed it to benefit from high levels of technology transfer.

F.2.3.4 Government Policy and Action

Government policy and action is important to the firm both because Government represents an important market sector for it and because government policy and action affect the environment in other ways.

With regard to Government as a market sector, the interviewee believed that there had been significant changes in recent years that benefited his firm. In particular, increased interest by governments in improving the quality of the public service through Public Sector Reform programmes had led to increased interest in the use of IT. The interviewee also felt that governments were moving more towards a "partnership style of operation" in dealing with the private sector and that was creating improved opportunities for vendors.

Recent actions to pass legislation supportive of IT use in Barbados was seen as further encouraging use of IT and thus improving the market. He emphasized this by stating that:

“... businesses will take up the challenge of moving online in a very serious way in terms of their operations. Previously they would have been stunted because even though they may have wanted to do a lot of things, pertaining to commerce, they would have been held back by the legislation or lack thereof. So in that way you can see how government is using legislation as a catalyst to move activity in the direction that will allow for more creative use of Information Technology.”

In both instances, it appears that current government policies and actions are benefiting the firm and that it is moving to take advantage of this situation.

F.2.3.5 Influences of Caribbean and International Context

The firm's perceptions of the Caribbean environment directly affects the competitive strategies that it employs. The interviewee explained the importance of the focus on Government by stating that governments in the Caribbean employ about 20 percent of the workforce, making them major employers. Also, governments were seen as major enablers in influencing the use of IT, and for that reason, one of the services offered by the firm was assisting governments in developing national IT policies and strategies.

The firm also carries out assessments economic conditions from time to time in the

markets that it operates in order to determine future business prospects.

The interviewee did not give any indication that any general environment factors outside of the Caribbean impacted their planning or activities.

F.2.3.6 Public Perceptions and Expectations

The firm pays significant attention to public perceptions and expectations of IT in developing its competitive position. The interviewee explained:

“... one of the things that informs us in terms of how we put together our competitive strategy is what the perception is in the market and yes we do go to a level where we look at what the individual market, and this is the public, actually perceives information technology to be, where they see it fulfilling a role in their own lives and what has been the public response to initiatives that Government has put forward in this regard. There is a continual testing of the market as part of our overall assessment of what our competitive strategies should be.”

He also stated that his firm attempts to determine “what the feel good factor is” in the overall environment in order to drive its business. He did not give any indication however, that public perceptions of IT affected the firm’s own use of IT.

F.2.4 Process

F.2.4.1 IT Development over time

When asked about how the firm’s IT had developed over time, the interviewee indicated that it had “evolved”. He added that it was “a process of being able to accumulate the resources over time and being able to work with partners, very focused, over a period of time and you get better”.

He did not however elaborate on specific developments over time and offered no explanation of how the recent reorganization of the firm had affected the development of its internal IT use.

F.2.4.2 How IT is managed

Provision on internal IT services is the responsibility of an “internal support group”. Despite several questions on this topic however, the interviewee did not seem able to provide a clear picture of how the firm’s internal IT was managed. For example, in responding to a question of whether there were management persons specifically responsible for the internal IT operation, he stated:

“That is an interesting question. How do I answer that? The way our business is run because of the type of business that we are in there is some person who is in charge of operations but in terms of the overall day-to-day operations of the company that has been pushed down to lower levels in the organisation.

There is a little bit of an [alternative] perspective there. The operations of the company are actually pushed down to a lower level.”

He indicated that while there were persons who were primarily responsible for providing IT support internally, those persons were also sometimes used to provide client services.

In general however, the interviewee’s responses did not allow a determination to be made as to how IT was managed to derive the expected benefits mentioned during the interview.

F.2.4.3 Role of IT

The interviewee described the role of IT in the firm as that of an enabler, allowing the firm to deliver its services as efficiently as possible. The expectation was this would make the firm more competitive, as explained below:

“One of the things we believe that will give us a competitive edge is the way we do business internally and the kind of platform that we put in that will allow us to very efficiently run our business and at the same time create the kind of competitive environment that will allow us to move very, very quickly. In other words, we believe that an agile environment within our organisation allows us to be able to compete not only very effectively but very efficiently and we do see information technology as a weapon in that regard.”

F.2.4.4 Competitive Responses

During the discussions, two main competitive responses (to the changing competitive environment) were described. The first was the restructuring of the company and consolidation of its activities which allowed it to compete more effectively on a regional scale. The interviewee explained at the beginning of the interview, as follows:

“[Firm A] is a company that has been formed out of these 6 companies to provide regional focus now to our activities. All the activities in Information and Communications technologies are broadly held under the umbrella of [Firm A]. What we have done then is that we have created an end-to-end solutions company that allows any of our clients to access the myriad of services that we offer and we are able to move their businesses along with a whole host of various technologies.”

The second is the policy of ensuring technology transfer on projects implemented with assistance of partners from outside the region. According to the interviewee:

“... unlike say five years ago whenever there were major systems to be implemented within the Caribbean we had to go and look for a partner in the U.S who would come down and do everything and then that would be it, this is no longer the case. In a lot of cases now within the Caribbean,

because of the nature of how we structure our partnerships at that level, you will find that there is a lot of technology transfer that takes place and a lot of learning that goes on between our company certainly and our partners that allows us to be able to take charge of the delivery of services to our clients ... It allows us to be able to gain the expertise, gain the trust, gain the services and ultimately gain the respect of those who we deal with within the Caribbean and it allows our partners to be able to participate in the Caribbean and at a profit.”

In explaining why this contributed to his firm become more competitive, he explained:

“With respect to some companies who decide to invest directly within the Caribbean as opposed to those who decide to use joint partners there are significant advantages, we feel from our perspective, that will allow us to be able to compete effectively against those who do so ...”

F.2.4.5 Business and IT Strategy

Although the respondent indicated that the firm had a formally articulated business strategy and that IT was a part of that, he gave very little indication of the processes involved in developing the strategies or in converting them to operational plans and executing them.

F.2.4.6 Staff Training

The interviewee indicated that the firm provided a significant amount of IT training for its staff to make them “multi-skilled”, and “to be able to take on the challenges that are there not only from a job perspective but from a client perspective”. Although he stated that a “large component” of the firm’s annual budget is spent on such training, he did not elaborate on the processes by which this training is effected or the level of satisfaction with the outcomes of the training.

F.2.5 Content

F.2.5.1 IT Applications Available

According to the interviewee, “almost everything” was automated. He made specific mention of finances and sales. He also reported that the firm is currently implementing a Sales Force Automation system to “enhance the image” that the firm presented to customers and better manage details. The interviewee explained the importance of this application to the firm by stating:

“There is no question about success because one of things that it will do for us is that it will allow us to be able to move a lot quicker in responding to our customers’ needs in terms of own research activities that we carry out in-house with regard to seeing every customer as a single customer rather than looking at our broad expanse.”

F.2.5.2 Extent of IT Use

IT is widely used within firm, with the interviewee reporting “probably even more than a one to one” ratio of computer access points to users. As indicated earlier, he also reported that “almost everything is automated”. He also stated that the firm was “very focused on technology, not only from a selling perspective, but also from a utilization perspective”.

F.2.5.3 Benefits Realized from IT

While the interviewee spoke highly of IT and the expectations of the benefits it could bring to the firm, he offered few examples of specific benefits that have been derived from IT use. The example he mentioned was the use of IT to support the preparation of bids for government contracts, which are important to the firm. Such bids usually have to comply with very exacting specifications for format and content. The contribution of IT in this regard was described as follows:

“We have found that information technology as an enabler allows us to respond very quickly, allows to be able to respond on time and allows us to be able to very quickly assemble the components from various sources, which in any given tender is a requirement, to be able to assemble the components of a particular tender that would make a manual platform or a different platform very difficult to do. We see information technology as a vehicle for rapid response and not only rapid response but accurate and easy response to those sorts of things. What it does for us is that it allows us to be able to be very accurate in how we respond.”

F.2.6 Summary

During the discussion the interviewee portrayed the firm as one that had a well-organized business and IT strategy and one that derived significant competitive benefit from IT. The various elements of the Internal Context seemed well aligned towards this – senior management not only supported but were proactive in promoting IT use within the firm; the firm had a high level of competence in IT, partly derived from its interaction with other vendors and partners; staff were both highly supportive of and highly skilled in IT use; and there were generally high expectations of the ability of IT to contribute to the firm’s competitiveness.

The interviewee considered the main competitors to be traditional large foreign-based IT service providers that operate in the Caribbean on a regional scale. There were no indications that he considered smaller local firms to be a significant factor. He did acknowledge however, that non-Caribbean firms with no established base in the region were becoming more of a competitive factor, although he did not seem to consider this significant.

The firm had two main competitive responses to the perceived changes in the

competitive environment. One was to restructure itself so that it could compete more effectively on a regional scale and the second was to change the nature of its engagement with its business partners so that there was more opportunity to increase its own capabilities through technology transfer.

Although the interviewee reported that there was an “operations group” that was responsible for internal operations including IT, and that there were staff dedicated to provision of internal IT services, he did not make it clear how internal IT services were managed. In particular, it remained unclear where the decision-making responsibility lay for matters related to internal IT. It was also noted that although he initially stated that the staff were dedicated to internal operations, he later indicated that they were also used to provide services to clients.

Levels of IT use within the firm were high, with “almost everything” being automated and a very high ratio of computer stations to staff. The role of IT was that of an “enabler” – providing the firm with a “platform” that would enable it to be more competitive.

In general, the interviewee’s responses suggest that the firm is effectively using IT to support its competitive position, and that it is deriving the benefits it expects from IT. It’s position as a provider of IT services and internal IT capabilities contribute to this.

While the four dimensions of the analysis (Internal Context, External Context, Process and Content) are consistent with each other, the lack of specific examples and illustrations does raise some questions. The main cause for concern is the fact that the interviewee represents a IT services firm, and as such, may be inclined to portray IT in the most favourable light.

F.3 Firm B – Interview with Director for Marketing and Distribution

F.3.1 Background

Firm B is primarily an import distribution company, whose main business is the importation of a wide range of products for sale to retailers such as supermarkets. It is involved, to a lesser extent, in Insurance, computer sales and stationery retail. It is part of a network of similar companies operating in several Caribbean territories and has a staff of approximately 240 persons.

Separate interviews were held with IT Manager and the Director responsible for Marketing and Distribution. The IT Manager, who has day-to-day responsibility for the firm’s computer systems, reports to the Financial Director.

The Director responsible for Marketing and Distribution is part of the executive management of the firm and had been with the firm for 16 years, but in the current position only for 4 years at the time of the interview.

F.3.2 Internal Context

F.3.2.1 Management attitudes

The interviewee's responses to questions about the attitude of the firm's management towards IT suggested that it was an inhibiting factor. In particular, he felt that some members of the management team were not adapting to the use of IT. He explained as follows:

“I would say that we have a situation where the majority of our management have been around for a long time. They are experts in their particular areas but many of them would have grown up in a non-IT environment. Some have adapted to using IT as a necessary evil, if I could phrase it that way, some can't and won't adapt at all and you know they have to have people with them who can get the information and put it in a format for them that they can use. Then of course you have a different newer generation to whom this is a snap of a finger and who are extremely comfortable in this environment and actually cannot function in any other environment. You go from one extreme to the other so there is quite a mix there. I would say overall that the power of IT is not appreciated by all, on balance.”

While he did not indicate any form of active opposition towards IT, the lack of strong support at the senior management level manifested itself in a situation where the firm was not very proactive in seeking benefits from IT, as the interviewee explained subsequently:

“I think because of the management that I described we have a lot of people are not really aware of what the system or systems can produce. I think there is need for significant awareness building in that area.”

F.3.2.2 Sources of Competitive Advantage

The sources of competitive advantage for the firm emerging from the discussions appear to be the fact that the firm has a “full infrastructure” (as opposed to some of its smaller competitors) and its knowledge of its customer base and its market. The interviewee did not give the impression however, that he thought his firm was fully exploiting these advantages and in particular, pointed to opportunities for deriving greater benefit from IT in supporting these strengths.

F.3.2.3 Expectations from IT

The areas where the interviewee expected IT to make the greatest contribution were Inventory Management and provision of sales and marketing information. Inventory management was seen as being critical to the type of business and particularly important because it was the “base block at the bottom of the pillar”, as he explained:

“Obviously management of inventory in the situation that we just

described, has always been critical but is probably even more so now because the flexibility that you need to operate in the environment that you just described is obviously more so. So you need to have a very responsive system in terms of inventory to manage your inventory sensibly but I think that is probably the number one important factor as far as IT is concerned that is in the inventory management. That has been traditionally so and is only more so now. Coming out of that is sales and marketing information so you look at inventory as the big base block at the bottom of the pillar. The second way I would relate to the ability to capture sales and marketing information, it can become critical in our relationships with suppliers. If we bring something to the table it should be our expertise in knowing our customers and knowing our market.”

The production of sales and marketing information, which was alluded to as an important contribution several times during the discussion, was seen a benefit that would flow from an improved inventory management system.

F.3.2.4 Effect of Age of Staff

As indicated in the discussion on management attitudes earlier, the interviewee felt that the age of some of the management team was a factor affecting the disposition towards IT, and in particular, those that had “been around a long time” seemed more reluctant to embrace IT.

This also affected the issue of how IT was driven in the firm. In responding to a question about where the impetus for IT within the firm should come from, the interviewee indicated that he felt it should come from IT Department because of the age of the firm’s management team and their attitude towards IT made them less disposed towards taking a lead role. He explained:

“That is probably why we haven’t gone where we should go because there is a grey area as to where this emphasis should come from. Where do I see it should come from? I feel it should come from IT. That is mainly because of management’s side, it has a lot of people in it who are not familiar and that’s why I think the impetus needs to be more from IT. If we had a management that were all in their 20s and 30s who all grew up with this, I think the emphasis would be on them to be pressing IT for what they need. I see this more being in reverse where IT has the responsibility to show them what can be done and what is available.”

F.3.2.5 Source of IT Impetus

As mentioned in the discussion on the effects of age of staff, the firm seems to be experiencing some difficulty in determining how IT should be driven from within. The interviewee’s view is that since the firm’s senior management does not seem disposed to IT, the impetus should, of necessity, come from the IT Department.

The apparent lack of clarity on where the responsibility lies for driving IT also seems to have other effects on the use of IT. In discussing whether IT was making the expected contribution to the firm for example, the interviewee stated:

“I think it is making a significant contribution but it is not making the contribution that it can. I think that there are two sides to this story. The potential users are not asking for the type of information that is widely available on the other hand the providers are not focussed on spreading the gospel either, so you have a problem at both ends of the scale. These are slowly being overcome.”

F.3.2.6 Other Internal Constraints

The discussions pointed to at least two other internal constraints – one technical and one staff-related – that was affecting the firm’s use and potential use of IT. Both of these related to the potential to use IT to better support the firm’s sales and marketing activities.

The firm faced a potential constraint in further automating the sales activities, because of concerns about the “trainability” of the sales staff. The interviewee expressed this as follows:

“We have considered over the last couple of years moving from a system where orders are taken manually by individuals who then bring those orders into the headquarters where there are individuals specifically assigned to do nothing but process these orders through the computer system and produce bills and therefore order the delivery. The ability to automate from that system is something that we are toying with. We have had a couple of proposals but there have been some obstacles which we have not yet overcome or have the will actually to try to overcome. They would more relate obviously to moving towards an automated sales force who can actually do their own order processing and generating of invoices and so on requires a significant amount of training. You could also say that that is at best case. The worst case scenario is there are people who are untrainable in the area but who may be good sales people and are we willing to sacrifice a good salesman just because he can’t adapt to an IT environment? So that has been one of the challenges which you need to face and overcome and make it work.”

In continuing, he indicated that “the sheer wealth of SKUs” (the high number of different inventory items the system had to handle) was proving to be a technical challenge. According to him:

“The second one would be sheer wealth of SKUs that are involved in an operation like this or indeed in [associated firm] in that no system ... its overwhelming ... to be working that type of an SKU a complement and it poses problems then to the actual hardware and so on. I don’t think these problems are insurmountable but then you have to ask yourself obviously the efficiency of this should be quicker order processing therefore quicker delivery to the customers and therefore quicker received orders, that is if everything works well.”

F.3.3 External Context

F.3.3.1 Sources of Competition

In describing the firm's competitive environment, the interviewee identified four categories of competitors, as follows:

“Well I think you can look at what basically is our core business which is the business that you would most associate with being similar to that of [Firm B]. Our competitors obviously are other import distribution firms like ourselves and by like ourselves I mean companies that have been around for a long time and are medium to large size firms with full infrastructure would be a classical competitor. Now there are several scores of much smaller importer distributors who obviously operate on entirely different scales in terms of infrastructure but who are still basically the same model and then you would have retailers who have become importers on their own rights and finally then we now have some foreign input in the competition coming from PriceMart and eventually Kmart. I think that probably is the competitive framework.”

Three of the categories – other import distribution firms similar to Firm B, smaller competitors who operate on the same business model and retailers who have become importers, all represent local competition. The other category represents foreign-based retailers.

The above would suggest that local competition is the most significant. As Firm B was primarily an import distribution firm whose customers were retailers, the interviewee felt that the main threat from the foreign-based concerns referred to was that any market share they were able to take away from local retailers represented a potential loss of market share for Firm B.

The interviewee also acknowledged that there was foreign competition in the form of consumers and retailers buying products directly from outside the region. He stated:

“Obviously, in the wider scenario, people are accessing, both retailers and individual consumers, are accessing products from businesses in the US and also from the wide area, products that serve their individual needs, bypassing traditional channels. I can't say this is a huge factor in our kind of business but the perishability in the nature of what we do has aligned itself to a lot of that doesn't make economic sense but in certain sectors of the economy certainly it is significant.”

He went on cite the used car and computer markets as examples where this form of competition was significant. (Note that while the firm is involved in computer sales, there was no indication that it was involved in automobile sales).

F.3.3.2 Changes in Competition

The interviewee was able to provide a succinct description of how he perceived the competitive environment to have changed in recent times so it is appropriate to use his own words to summarise the situation:

“Certainly, first of all the numbers of these what I would call these smaller or one-man type import distribution operations would have expanded significantly in that time. The foreign competition is obviously new. The level of retailers taking on the importation role has risen dramatically as well and there has also been significant merger-acquisition activity in this sector of which we have been involved.”

Note however that during the discussions, he did not elaborate on the “merger-acquisition activity” that he referred to, and how if at all, it affected the firm’s competitive position.

F.3.3.3 Technology effects

One example of technology affecting the competitive environment was highlighted by the interviewee – that of loss of sales to local computer and automobile dealers because customers were “doing their own thing on the ‘Net’”. Although clearly recognising it as an increasingly important threat, the interviewee did not seem to think that it’s impact has become significant, except for the two markets identified.

F.3.3.4 Consumer Behaviour

Consumer behaviour only emerged as a factor in this interview with respect to the fact that customers were now able to use the Internet to make purchases directly from non-Caribbean competitors, bypassing the local distributors. As indicated earlier, this was highlighted as an issue mainly for the computer and auto sales markets.

F.3.3.5 Sources of Competitors’ Advantage

While there was not an extensive discussion on the source of competitors’ advantages, the interviewee indicated that he believed some of the competitors derived an advantage from more effective use of IT, particularly with regard to the generation and use of sales information.

In discussing the problems that the firm was facing in trying to make better use of the inventory and sales information handled by the system, the interviewee stated:

“I see that as a major challenge right now in putting that to maximum use because that is the type of information that our foreign competitors and the small independent competitors can generate and that is an area that our IT can score important points.”

He mentioned that “one or two” of the “more specialised competitors” had already introduced highly automated order processing system. Firm B at this stage was considering that idea. In discussing possible competitive responses, he also expressed

the view that the smaller competitors derived an advantage from being better able to maintain a narrow focus on a particular product or service.

F.3.4 Process

F.3.4.1 Role of IT

The discussions suggested that the primary role of IT within the firm was provision of support for the firm's day-to-day activities - particularly inventory management, sales and billing. The interviewee also alluded to the increasing use of IT to develop and deliver presentations to suppliers and customers. This he considered particularly important, as this was one of the ways the company obtained new business. In this regard therefore, he saw IT playing a significant role in improving the competitiveness of the firm.

In general however, the role of IT within the firm appeared to be primarily operational.

F.3.4.2 Competitive Responses

The interviewee identified two specific responses that the firm was undertaking to address the competitive environment. One was to position itself as a "regional player", taking advantage of the existence of a network of affiliated companies operating in the Caribbean. This also involved setting up a North American base in Miami, USA. He explained the strategy and rationale as follows:

"I think our primary focus in terms of a response has been to position ourselves as a regional player as opposed to being an island-locked player operating in Barbados, through the network of companies that [Firm B] has throughout the region and more recently through our setting up of, if you want to call it, a North American base in Miami which will service our existing network which is a simple logistical type operation and that going beyond that into offering services direct to retailers where our wholesale operations on the ground may be unable for a variety of reasons or the retailers are not with them, we can open up a new channel and that channel is direct retailer from our operation in Miami which can bypass our on the ground operation but still ensures a piece of the pie which you would not get otherwise. Or alternatively, our operation in Miami to other distributors and wholesalers other than the companies that we actually have shareholdings in. Our major emphasis at the moment is on the region as in relation to the company and the hub in Miami."

The second response was to "divisionalise" the operations of the firm to better allow it to provide better focus on each of its range of products and services. He explained this as follows:

"On the ground, what you basically try to do I believe or where you are a large business is, is try to divisionalise yourself and have people working brands and so on so that you achieve some of the advantages of although

being large, still have the narrow focus that a smaller distributor has. That's generally where the smaller distributor would cope over the larger one is in their narrow focus in a particular product or service, which is always harder for somebody who is larger and diversified to compete against."

The interviewee did not elaborate on how he saw the firm's use of IT supporting those responses.

F.3.4.3 Business and IT Strategy

The interviewee gave no indication that the firm had a formally articulated business strategy, or that the IT-related activities were driven by some form of strategy or high level planning process.

F.3.4.4 Improving IT Benefits

The interviewee felt that there was significant opportunity to improve the benefits the firm derived from its existing IT resources. One of the main requirements for achieving this was creating greater awareness of what benefits could be derived from the available resources, as he explained:

"I think once people realise the type of information that is available and how helpful it could be, which is a function both of the IT and I think to some extent the sales and marketing areas of the company. I think they have to combine to spread the gospel so to speak and that has not really happened. It happens on individual levels for projects but it hasn't happened on a wider scale. I think that is critical because I think that really is the most important hurdle because what I can see where the type of help and information you can get from the system. The second part of how you actually get it is not that difficult and I think you can overcome that one pretty easily with limited amounts of training but it is to get over the first hurdle which is to appreciate what is there and to utilise it."

The above statement again speaks to the issue of where, within the firm, the impetus should come from for driving IT.

F.3.5 Content

F.3.5.1 IT Applications available

From the discussions, it appears that the main computer application used within the firm is the system that supports inventory management and sales. The inventory management functions seem to be the most important, with the interviewee referring to inventory management as the "base block".

The interviewee also made reference to the use of presentation software which he had proven very useful to the company in its marketing efforts.

There was no indication that the company used any highly specialised or customised applications for its activities.

F.3.5.2 Extent of IT use

The interviewee described the extent of IT use by stating that “probably 90% of those who could benefit from interfacing with IT on a day-to-day basis have that capability”. He added that there were persons in the firm “who believe they should have IT but if you look at their job function there is no economic reason for it”. (He did not indicate the number of users this represented, but the IT Manager provided that information in a separate interview).

This view on who should have access to IT within the firm is consistent with the relatively limited range of applications indicated during the discussions.

F.3.5.3 Benefits realized from IT

The interviewee felt that the “inventory block” – the inventory functions of the main application being used – “was well understood and utilized”. He did not seem to think that adequate benefit was being derived from the other components however, particularly those that supported sales and marketing.

One use of IT that was singled out as being particularly beneficial to the firm was the creation of computer-based presentations. He explained why this seemingly routine use of computers had taken on such importance for the firm:

“Increasingly, the way that you get business or indeed keep business in terms of working with suppliers and indeed with customers to some extent involve the making presentations, significant presentations. The ability to manipulate IT and to work with it can give you a significant advantage if you have expertise in that area ...”

He saw this as something that could help the firm gain competitive advantage and pointed out that previously, development of such presentations necessitated engaging an advertising agency. He indicated that the firm was hoping to provide additional training for staff in this area to make greater use of such software.

F.3.5.4 Potential or Unrealized Benefits

In general, the interviewee did not believe that the firm was deriving the benefits it could from its existing IT resources. Particular potential benefits that he thought were yet to be exploited were:

- Use of the sales and marketing information that was available from the system
- Increased automation of the order taking process to eliminate the practice of orders being taken manually by salesmen and then brought to the office for processing through the system
- The elimination of personnel whose primary function was to “just process

information on the computer”.

F.3.5.5 IT Successes

The most notable success reported was “going online” – moving from a batch oriented system to a real-time system. According to the interviewee, this resulted in more up-to-date information becoming available through the system and reduction of duplication of work.

F.3.5.6 IT difficulties

“Going online” had also created its difficulties. The difficulty emphasized by the interviewee was that receiving at the warehouse was not online and meant that details of goods received had to be keyed into the system some time after they were received. This resulted in delays in such receipts being reflected in the system. During that time, the goods could not be sold.

Throughout the discussions, he also alluded to the difficulties due to staff not making adequate use of the available resources, particularly with regard to the use of available information of sales and marketing information. These appeared to be operational and behavioural difficulties however, as opposed to technical.

F.3.6 Summary

The interview suggests that several factors in the Internal Context are inhibiting the use of IT. Much of this seems to stem from weak management support for the use of IT, which the interviewee attributes partly to their age.

The weak management support for IT manifests itself in a lack of clarity on where the impetus for IT within the firm should come from and who should be driving IT. The interview suggests there is no “champion” for IT, with neither the supply side nor the demand side taking a proactive position in promoting increased IT use throughout the firm.

It was also noted that while the firm considered its larger size relative to several of its competitors and its “full infrastructure” to be among its sources of competitive advantage, there is no indication that it is using IT in a way that would leverage those advantages. Indeed, the interviewee’s comments indicate that the smaller competitors are able to make more effective use of IT.

The interviewee was able to articulate a clear view of the nature of the competitive environment – who the main competitors were, the relative importance of the different categories of competitors and how the nature of competition was changing. Local competitors seemed to represent the most significant competition, although he acknowledged that foreign competition was increasingly becoming a factor.

Changes in consumer behaviour, facilitated by access to the Internet, was also leading

to changes in the competitive environment with consumers increasingly able to bypass local vendors and purchase directly from foreign competitors. This had proven to be particularly important in the used car and computer markets.

The interviewee acknowledged that the firm's competitors, both the smaller local ones and the foreign one, may be able to derive competitive advantages by virtue of more effective use of IT, particularly in generation and use of sales information.

There was no indication that the firm had a formally articulated business strategy. However, the interviewee was able to articulate clearly and concisely, how the firm intended to respond to changes in its competitive environment. The principal strategies were to increase its geographical scope of operation through establishment of a North American base and collaboration with its partners in the regional network, and to "divisionalize" its operations to allow it to better focus on each of its products lines.

Despite the clear articulation of the competitive response, there was no corresponding articulation of the role of IT in supporting that response. The main role envisaged for IT was in generally improving the availability of sales and marketing information to support the various competitive strategies.

The extent of IT use and range of applications appears to be limited. Most of the discussions focussed on a particular application that provided functions for inventory management, sales and billing. There was also some discussion of the use of presentation software. As a caveat however, it should be pointed out that the interviewee, as Director for Sales and Marketing, chose to focus only on applications of interest to him and ignored others, for example, accounting applications.

Despite the importance of inventory management to the operations of the firm, as emphasised during the interview, it was noted that use of the inventory management application had not been extended to receiving at the warehouse, creating some difficulties.

In general, several of the above elements particularly lack of senior management support for IT, ambiguity in the source of IT leadership, the apparently limited range of IT applications, the focus on operational level IT use and the perceived benefit of relatively simple IT applications, suggests that IT within the firm is at a relatively early stage of maturity. This view is further reinforced by the fact that the interviewee believes that one of the major obstacles to greater IT use is getting the users to appreciate what IT can do for their work.

F.4 Firm C – Interview with Divisional General Manager for Manufacturing and Services

F.4.1 Background

Firm C is a conglomerate involved in several different types of business activity, the key ones being:

- Import distribution
- Manufacturing
- Airline catering
- Automobile Sales and Rental
- Insurance (non-Life)
- Retail

The firm is structured in 3 divisions as follows:

- **Airline catering.** The businesses in this division provide catering services to airlines. Of the 3 divisions, this one has the most geographically diverse operations, having operations in several English-speaking Caribbean territories as well as in St Maarten, El Salvador, Guatemala, Venezuela, Colombia, Ecuador, Paraguay and Uruguay.
- **Import Marketing and Distribution.** The businesses in this division are traditional import businesses, including auto sales and service. Businesses in this division have operations in Antigua and Barbuda, Barbados, St Lucia and St Vincent and the Grenadines. One of the interviewees (the Divisional General Manager referred to below) also stated that an operation was due to open in Grenada shortly.
- **Manufacturing and Services.** This was described as including 12 companies involved in businesses that ranged from “meat processing to bakery to shrimp and fish processing in Guyana to rum distillery to different things”. While this division is dominated by manufacturing operations, it also includes services such as Insurance (non-life).

Each division is headed by a Divisional General Manager, who reports to the Managing Director.

Interviews were held with the Group IT Manager and with the Divisional General Manager (DGM) for the Manufacturing and Services division. The DGM, as a senior executive, was in a position to speak on behalf of the firm in general and not just for his division.

The DGM has been with the firm for 13 years, and had been in the DGM position for 7 years at the time of the interview.

The firm is a publicly traded company, and has been in existence for approximately 80 years. It was originally family-owned, and according to the DGM, the founding family still owns approximately 60 percent of the shares. He stressed however that it

was no longer run as a family business and that only one of the firm's executives, the Managing Director, was from the founding family.

The annual turnover is of the order of US \$175 million. According to the DGM, approximately 50 percent of the firm's business, by assets or revenue, is in Barbados while the balance is spread among the other 15 Caribbean and Latin American territories in which it operates.

The DGM indicated that within his division, each subsidiary company was "self-contained", with its own General Manager, and depending on its size and type of business, other types of staff such as accounting, sales and production. He described the management of the firm as being "relatively decentralized", with each company being a stand-alone unit. The firm also had "fairly extensive guidelines" to provide commonality in a range of matters such as human resource management policies, financial management guidelines and operational procedures.

F.4.2 Internal Context

F.4.2.1 Management Attitudes

The DGM described the attitude of management towards IT as generally receptive, "where it automates things and makes things faster". He also indicated that as part of their performance evaluation, managers were expected to be actively looking for efficiencies, and that served as an incentive.

There was however a limit to this support, when it involved radical change. According to the DGM, when IT introduction was considered radical, "they're not actively opposing, but where it moves outside their comfort zone in terms of how they see their business running, they're not active embracers of it either".

It should be noted, as discussed under Organizational Structure, that most of the management decisions about IT use are made at the level of the individual companies or business units, as opposed to the Head Office level.

F.4.2.2 Organizational Structure

The DGM explained that firm has a relatively decentralized structure with each "operation" (typically a subsidiary company) being a standalone unit with its own management structure. In general, each operation made its own decisions about its IT use. Some of the larger operations had IT staff while most received IT support through staff based at the head office.

The decentralization of decision-making about IT, along with significant differences in the types of business within the group led to significant differences in types of IT used, extent of IT use and attitudes towards IT among other things. It also affected the way that IT was implemented.

F.4.2.3 Attitudes of Non-Management Staff Towards IT

The attitude of the staff was “relatively positive”. The DGM attributed this to the introduction of IT not displacing existing staff. He also pointed out that the firm generally experiences more resistance when introducing technologies other than IT – particularly manufacturing technology.

F.4.3 External Context

F.4.3.1 Sources of Competition

Because the firm is engaged in several different types of business, it has several different types of competitors. The DGM explained that for benchmarking performance, it compared itself to other Caribbean conglomerates, but when considering competition, this was looked at on the basis of the different types of business.

By way of example, he identified other import distribution firms as the competitors of the firm’s import distribution business, while other international airline catering businesses competed with the firm’s airline catering division.

The firm faced significant competition from both within and outside the region. The airline catering business was a peculiar case, because it was by nature and international business, and as such, it’s competition had always been international.

F.4.3.2 Changes in Competition

There had been a number of changes in the competitive environment in recent years that affect the firm’s operations. The DGM summarized these as follows:

“I think 2 changes, one which ties in with the other. If we look back 10 years, in almost all of our businesses the competitors would have been local or perhaps regional, depending on the product. ... In most of our traditional businesses ... the competition was a local company in pretty much the same business and that’s who you were fighting with for your share of the market. Now, as I indicated earlier, 2 things have happened. One is some of the business models have changed, and we are seeing now our competitors in some cases were our suppliers, in some cases were our customers and people have changed business models, and that’s particularly so on the import distribution side of it. Less so on the bakery side ... and even so ... on the bakery side there are more in-store bakeries going on now and so on. And then the other thing with that is that certainly more regional players have stepped in and with the opening of the market, we are getting more international players ... from the US and so on. We are in the car business for example ... now that is a question of the whole market changing ... from the very traditional ... you had an agency ... you were the only one who brought in [a particular model] ... that is seeing a model change completely with reconditioned cars. Two things - one is the availability of reconditioned cars, married then to the

use of the Internet, and that whole industry is going through a revolution. ... The industry that 5 years ago, other than a few imports by returning nationals ... probably the industry commanded 98% of the market share. I believe it is down somewhere ... in Barbados ... somewhere around 40-50% of the market share ... for the traditional industry.”

Thus it appears that the competition has changed in several ways – new competitors have entered the markets, existing competitors have changed their business models and international competition has become much more significant. In general, the DGM’s summary suggests the firm faces considerably more competitive pressure presently than it did 10 years ago, much of this attributable to non-Caribbean sources.

F.4.3.3 Technology Effects

In describing the changes in the competitive environment, the DGM pointed to a “model change” in the auto sales business, which he attributed to “the availability of reconditioned cars, married to the use of the Internet”. This situation, which includes customers ordering used cars directly from Japan via the Internet, has led to a significant drop in sales of the firm’s auto dealership. Therefore, the use of technology has played a significant role in increasing the competitive pressure on the firm.

F.4.3.4 Consumer Behaviour

The main change in consumer behaviour identified as being relevant to the discussion was the increased practice of individuals importing vehicles directly and bypassing traditional auto dealerships. This was facilitated by increasing access to and use of the Internet and its impact on the traditional dealerships had been significant.

F.4.3.5 Availability of External Support

With regard to day-to-day use of IT, availability of external support did not seem to be a factor. However, the lack of availability of software applications for some of the firm’s more specialized operations was a constraint that forced the firm to look abroad for certain types of services, as the DGM explained:

“The level of service capacity here is reasonable by Caribbean standards. The usual problem everywhere else, we complain about the service providers, but it’s not as though you’re scrambling to find somebody ... there are usually 3 or 4 persons who can provide it to you, but some you may not want to deal with because of past experiences or what have you. That though, tends to be more in the hardware and ... I don’t know if I’m right in saying this ... the systems software side of it. We are lacking on the applications software. You find that when you are looking for a specialist system, whether for a bakery or a meat processing plant, because there is maybe two bakeries in Barbados that support it and one meat processing plant, nobody has that level of expertise here, so that is actually a constraint ... when you’re having to look for applications software for your business, you’re often having to look abroad.”

He did not give any indication however, that this had the effect of limiting the firm's use of IT.

F.4.3.6 Comparison of IT to Competitors

The DGM felt that the firm's use of IT was "average" to "slightly above average" when compared to other Caribbean companies. According to him: "I am not going into companies and being bowled over saying 'boy, these guys are far ahead of us'". He felt however that when compared with non-Caribbean firms, his firm was behind. He did not attribute any competitive disadvantage to this perceived difference in IT use, however.

F.4.3.7 Government Policy and Action

The DGM felt that the decision of several Caribbean a number of years earlier to remove much of the import duties and taxes on imports of computer hardware and software had been "quite innovative", implying that it had the effect of encouraging use of computers.

On the other hand, he felt that lack of automation of certain government procedures was hindering the firm's own use of IT. He cited the example of processing of Customs documents, which is a very important activity for a company heavily involved in import and export activities. He noted that while the firm did much of its preparation of these documents "online", it had to be taken "offline" to be processed by the Customs, because there were no facilities as yet for electronic processing. (Note: The interpretation of the above is that the firm processes its customs documents on the computer but has to print hard copies to submit to the Customs and Excise department for manual processing and approval).

F.4.3.8 Other External Constraints

High telecommunications cost was identified as a possible factor constraining the use of IT. The DGM was not certain whether this was significant for his firm however, stating that he was not aware of any IT projects within the firm that had not gotten "off the ground" because of it. He also pointed out that the firm's use of IT did not involve significant movement data internationally, making international telecommunications costs less of an issue.

F.4.4 Process

F.4.4.1 Development of IT Over Time

The DGM's description of the development of the firm's IT over time suggested a "stage" approach. He also suggested that they used the introduction of IT as an opportunity to make changes to processes. He described the situation as follows:

"The traditional areas in terms of business applications ... we are probably

a standard thing. First your accounting ... we went through that ... and then moving up the level in terms of business applications, manufacturing, sales, billing and so on. We have not been aggressive adopters of IT for the sake of IT and if anything, other than the communications with the Lotus Notes, we really have adopted IT, not at the last, but we probably run around the middle of the pack in terms of IT adoption. And we do it as we change ... often if it's combined with changing the way that we are doing business or something like that."

These comments imply the firm uses a cautious incremental approach to IT development as opposed to one of aggressively looking for opportunities to bring about changes through IT.

F.4.4.2 How IT Managed

The DGM stated that presently only the largest subsidiary companies have IT specialists, and that these tended to be at a technical level. For the majority of companies, IT management and support was provided from the Head Office level.

Each Division is assigned a MIS Manager who is responsible for supporting all the companies within that Division. The MIS Managers, who are based at the Head Office, report to the Group IT Manager.

The DGM did not offer any comment on the effectiveness of this arrangement.

F.4.4.3 How IT Deployed

While there was no extensive discussion on typical processes for deploying IT within the firm, the DGM indicated that the firm often used the introduction of IT as an opportunity for changing processes. However, in subsequent discussion on the matter he stated:

"I think we have readily accepted the modifications that come. So we are not so slavish that we say it has to do it exactly the way we used to do it. We've been sufficiently flexible that we have said "here a better way, because of what we have, to do it." What has not happened is perhaps the complete reengineering process that sometimes can come with IT and I think that we are guilty of not looking at some of that. When we go out we're generally saying, this is what we do, let's look at what can replicate it, just quicker and more accurate."

He conceded that the statement that the firm had not gone through the complete reengineering process that could accompany IT may appear to conflict with his earlier statement that the firm used IT introduction as an opportunity to change processes. On balance however, he felt that the firm was attempting to make changes to processes when IT was introduced, although not necessarily to the extent of completely "reengineering" the process.

F.4.4.4 Role of IT

The discussions suggested that the role of IT was primarily operational – facilitating the day-to-day business of the company. However, IT was of critical importance to the firm and the DGM felt that the firm’s survival depended on it. According to him:

“We could not be competitive without it. There are a number of things we have taken on board that when you look back, if we were not doing that, we would be dead in the water.”

One application that was singled out for allowing IT to play a more than operational role within the firm was Lotus Notes:

“We were quite an early adopter, in the Caribbean context, of things like Lotus Notes. We put in Lotus notes in 1995 ... and that particularly ... because we are quite widespread in terms of the number of companies we operate ... has really been a boon to our level of communication and so on.”

He explained the importance of this application by stating that there was no equivalent manual system providing the functionality that the firm had obtained and it has thus facilitated a level of communication and collaboration that had not existed before.

F.4.4.5 Business and IT Strategy

The DGM described the firm’s strategy as being akin to an iceberg – “90% of it is below water, so 10% of it is documented and 90% is not”. For the most part, the formally articulated and documented consisted of financial benchmarks that were used to assess performance. However, firm did not have “any grand plans that say that we are going to be in this business and this size by this year or anything like that”.

The documented strategy included some “general references about using the latest technology that is available”, but it did not articulate an IT strategy. The DGM suggested that the IT Department may have its own strategy for its own purposes, but stated that there was no IT strategy at Board level.

F.4.4.6 Improving Benefits from IT

While the DGM did not indicate dissatisfaction with the level of benefits currently being derived from IT, he agreed that there were opportunities to improve the benefits derived from IT. For example, there was still opportunity for using as an opportunity to “reengineer” the firm’s activities.

The firm also recognized that increased benefits could be derived from more proactive acquisition and use of IT. The DGM stated:

“We discussed recently whether we should be looking for someone not in

a traditional IT role of servicing and so on because you get bogged down - someone who is out there looking for new technologies, or new applications, new software that they can say, is suited to the Group.”

F.4.5 Content

F.4.5.1 IT Applications Available

The main applications used by the firm are the standard business applications such as accounting, sales and billing. There are also specialized applications used by the specialized subsidiaries, such as manufacturing. In addition, Lotus Notes is used throughout the firm for e-mail and group collaboration.

Lotus notes was singled out as the one application that facilitated collaboration and coordination among the diverse businesses and across the geographical spread of Group. With the exception of Lotus Notes however, the DGM gave no indication of whether the firm attempted to standardize the applications being used by subsidiaries of the firm.

F.4.5.2 Extent of IT Use

The DGM gave an indication of the applications being used by the firm, as discussed elsewhere. However, beyond stating that the firm’s use of IT was “average”, he did not offer an assessment (e.g. number of users) of how widespread such use was within the firm.

F.4.5.3 Benefits Realized from IT

One of the main benefits realized from IT was the increased communication and collaboration arising from the introduction of Lotus Notes. As indicated earlier, there was no manual equivalent to the functionality introduced by this system.

The DGM stated that the firm could not have been competitive without IT, and implied that the firm’s survival depended on it. He also indicated that the systems were being used for typical purposes such as reporting and obtaining production efficiencies. Apart from the discussion about the benefits from introduction of Lotus Notes however, he did not single out specific systems that provided specific competitive advantages for the firm.

F.4.5.4 Potential or Unrealized Benefits

The DGM concedes that the firm may not be taking full advantage of its IT capabilities. In particular, he suggested that there was the tendency to focus on replacing existing manual procedures or the functions of existing systems as opposed to deriving new benefits. He stated:

“Where we have not gone ... and that’s an adjunct to what we were

talking about looking at new technologies ... is really what information which would [pertain to] better management of the business can we get from the existing systems. The whole question of ... and I don't know whether this is the correct phrase ... but data mining and so on, has not come into it. If we used to get something out of an old system and we get it out of a new system and a few little extras, that's great. But how we're going to get into the guts of that system and get new information out, particularly on trends and so on ... that's not happening to the degree that is should be."

F.4.5.5 Experience with IT to Date

While acknowledging some unspecified failures, the DGM's view of the firm's IT experience to date was generally positive. He summed it up as follows:

"I don't have the figure, but I don't think there's question that we've had value for money. Obviously, I can point out specific projects that have been money down the drain, but we've had good value for money on an overall basis. We do not have specific targets for IT expenditure. IT expenditure has to be justified just as any other form of capital expenditure ... certainly if you're talking something new. Clearly there's the maintenance side of IT that again, that's monitored just as other expenses would be monitored. But generally, [we've gotten] value for money."

F.4.5.6 IT Successes

The DGM spoke of the firm's IT experience in generally positive terms but singled out the introduction of Lotus Notes as a particularly successful experience, because of its effect on the firm's way of working.

F.4.5.7 IT Difficulties

Although he alluded to some projects being "money down the drain" when asked about experiences with IT, the DGM gave no specific examples of examples of such failures. In general, his views on the firm's IT was experience and he spoke of few difficulties.

F.4.6 Summary

Perhaps the two key characteristics of the Internal Context for Firm C, which impact several of the elements reviewed in the analysis, are the disparate nature of its businesses and the decentralized nature of its management. Also important is the fact that it has had a significant amount of business outside of its home territory and indeed outside of the Caribbean for some time.

The attitude of management and staff towards IT seems generally positive, although the discussion did not point to an enthusiastic push for greater IT use from the management level. It is recognized however, that within the firm, much of the decision making on IT takes place at the subsidiary company level and therefore the

question of attitude towards IT may be more significant there than at the Head Office level.

The disparate nature of its businesses and the geographical scope within which they operate, means that Firm C has several types of competitors in different territories. It had also been exposed to non-Caribbean competition for some time. Nonetheless, the DGM was able to identify several changes in the competitive environment that were affecting the firm. One of the most significant developments with regard to non-Caribbean competition was the auto sales market where traditional dealers, including Firm C, had lost considerable market share because consumers were able to import used cars directly from outside the region, using the Internet.

The DGM did not indicate that IT gave his firm any specific advantage over its competitors. He also did not give specific indications that better IT use was an advantage for any of the competitors. He did acknowledge however, that the firm was probably behind its non-Caribbean competitors in the use of IT. He also felt that his firm could not be competitive without IT, and that IT was critical to its survival.

Because of the organization's structure, the firm has adopted a partly centralized and partly decentralized IT management arrangement. The largest subsidiaries within the Group have in-house IT specialists, albeit at a technical level, while the others are supported from Head Office. It was not clear how much influence the Head Office IT staff have on the IT policies and decisions of the subsidiary companies and to what extent they were involved in "driving" IT in these companies.

There appears to be limited strategic planning at the Head Office level, pertaining mainly to financial performance targets. IT strategy is not addressed at that level. This situation seems generally consistent with the picture of decentralized IT decision-making painted by the discussion.

The primary uses of IT appear to be operational, focusing on general applications such as accounting, sales and billing, as well as operational support for the different types of businesses – for example, manufacturing. The main exception appears to be the use of Lotus Notes for groupwide communication and collaboration. Introduction of this product seems to have brought significant benefit to the firm beyond what one would expect from simply computerizing a similar manual system.

The DGM's view of the firm's experience with IT was generally positive. While acknowledging that a few projects were "money down the drain", he did not give any indication that those failures had an overall negative impact on the views of IT.

It is somewhat difficult to discern from this interview what the general level of IT use is within the firm and what the overall state of maturity is, because much of the IT-related activity is decentralized and different subsidiaries can be at different levels or stages. Nonetheless, the DGM paints a picture of a generally stable situation where the firm is making reasonably good use of the resources available.

There are no specific indications that the firm has made specific efforts to use IT to directly address the changes in the competitive environment enumerated by the DGM. His statements reveal however, that at the senior management level, there has been some recognition that there are more benefits to be derived from proactive use of IT and that specific action may need to be taken to address these benefits. One of the options mooted was to hire an individual specifically to research opportunities for making greater use of IT.

F.5 Firm D – Interview with CEO

F.5.1 Background

Firm D is a conglomerate and is involved in several different types of business including:

- Import distribution
- Retail (supermarkets)
- Automobile sales
- Insurance
- Hotels
- Shipping

A short interview was held with the CEO and a longer interview with the CIO. The CEO had been with the firm for about 3 years at the time of the interview. The CIO had been with the firm for about 15 months.

F.5.2 Internal Context

F.5.2.1 Resources

While the discussions with the CEO did not generally suggest that availability of necessary resources was a major factor determining IT use, he indicated that financial considerations affected how the firm deployed its IT. In particular, stated that “the constraints of the available cash of trying to do everything one time so we had to be selective and do it industry by industry”, indicating that financial limitations made a phased approach necessary.

F.5.2.2 Management Attitudes

The CEO described the attitude of senior management as “very receptive”. According to him, they were “on a learning curve” but accepted this. On the other hand, he stated that middle management “took a lot of retraining”.

While the CEO did not specifically state that attitudes of middle management were inhibiting IT use, some of his comments during the interview created that impression that it was a factor. In particular, in discussing the firm’s experiences with IT, he noted that

“The managers that have been trained ... we have seen almost immediate benefits. Inventory control, a more timely reporting process, more up-to-date information which allows you to manage the business better and just-in-time inventory which is only possible with a good information system”

The CEO himself expressed a strong positive attitude towards IT at several points during the interview. Several of his statements suggested that he considered increased use of IT to be a necessity for the firm. For example, he stated:

“What I would say to that is that honestly the people who don’t embrace IT now are going to get left by the wayside. There are still people who think “I have done it this way for 50 years why should I come to work tomorrow and do it any different that I did it yesterday” and those people are going to get hurt, big time. We cannot avoid information technology and if our competitors have it we cannot sit back and say we don’t need it and there is a great danger of people not being proactive and playing catch up which can be very, very expensive. We are trying to do it in our own time at our own speed rather than being forced to do it at somebody else’s speed and in somebody else’s time frame.”

F.5.2.3 Sources of Competitive Advantage

The CEO identified two main sources of competitive advantage, with IT playing a significant role. The firm’s knowledge of the local market was seen as a source of advantage over foreign competitors. This could be further leveraged through the use of IT, as he explained:

“We have the advantage of knowing the culture in which we operate, understanding the environment in which we operate and we layer on top of that now, information technology which will drive the process that the company is involved in.”

Secondly, the CEO was of the view that with regard to local firms, his firm was “a little more advanced than the competitors at every level” in the use of IT.

F.5.2.4 Expectations from IT

There was a clearly stated expectation that IT would help make the firm more competitive, especially against international competitors. The CEO saw IT as “allowing us to get better information quicker to allows us to make better decisions quicker”. He also indicated that IT was a competitive necessity for the firm, adding

“I think the whole globalisation and liberalisation is the driving force behind the changes that we are making especially in the field of IT. We have spent literally millions of dollars in the last 3 years restructuring our whole approach to IT and using it to become more competitive in this globalised and liberalised world, far more competitive.”

While he cited the firm's "Food Group" (the business units involved in food and grocery retail and distribution) as a specific case where the firm expected to see "tremendous benefits within the next 12 months to the implementation of information technology that is currently going on", he did not elaborate on how he expected these benefits to be derived.

F.5.2.5 Attitudes of Non-management staff towards IT

The CEO reported that non-management staff had adapted to the introduction of IT better than expected. According to him, "they accepted the new technology and learned to use it a lot quicker than we thought they would have". He cited as a specific example of this, the use of handheld computers on trucks for customer deliveries.

F.5.2.6 SOURCES OF IT IMPETUS

The CEO did not speak directly to the question of "who" within the firm was most responsible for driving IT. Several of his statements however, particularly those expressing the view that increased use of IT was necessary for the firm's future survival, suggested that he was a key source of this impetus.

F.5.3 External Context

F.5.3.1 Sources of Competition

The CEO explained that the firm was highly diversified and had no "core business". It therefore faced different competitors in different industries that it operated. He did not identify any particular competitors – or the competition in any particular industry, as being more significant than others.

While acknowledging that the firm faced increased competition from non-Caribbean firms and that this was becoming an increasing threat, he did not give any indication that either Caribbean or non-Caribbean competitors represented a greater threat at present.

F.5.3.2 Changes in Competition

The CEO identified a number of changes taking place both locally and externally with regard to the competition. Locally, a notable change was increased merger activity. According to the CEO:

"... the competition that we are faced with similar to us are restructuring their businesses and you are seeing more mergers you seeing fewer larger companies, we are now competing with fewer larger companies rather than before we used to compete with several small companies"

With regard to non-Caribbean competition, he alluded to "globalization" and "liberalization" making it inevitable that more non-Caribbean competitors would

enter the market. He also felt that the economic and social conditions in Barbados, especially when compared to other Caribbean territories, was attractive to non-Caribbean competitors. According to him, “outside companies coming here and establishing businesses” was “the future of competition”.

F.5.3.3 Comparison of IT to Competitors

The CEO was of the view that his firm was ahead of its local competitors with regard to its use of IT. While he did not make explicit comparisons of the level of IT use compared to that of non-Caribbean competitors, several of his statements suggested that he believed the firm needed increased levels of IT use to be competitive against them.

F.5.3.4 Other External Constraints

The lack of suitably skilled persons was identified as a constraint faced by the firm as it attempted to make greater use of IT. The CEO felt that this translated primarily into a cost issue however, as the firm had to “spend a lot of money training and the learning curve is very long”.

He also cited the high cost of telecommunications as a constraint. He saw this as hindering the firm’s ability “to take this technology and make it more meaningful by taking it outside the country”.

F.5.4 Process

F.5.4.1 Role of IT

The CEO saw the role of IT as making the firm more efficient and allowing it to become more competitive, especially in light of increased competition from non-Caribbean firms. In response to a question on this matter, he stated:

“... basically and I think that without IT the way the world is going it would be impossible for us to compete. But I am embracing this relatively new culture to us, embracing it the way that we are embracing it allows us to be more competitive, allows us as a Barbadian company, hopefully, to be competitive with even bigger companies coming in from outside.”

This is generally consistent with the expectations of benefits from IT discussed earlier.

F.5.4.2 Competitive Responses

The only competitive response identified by the CEO during the interview was the use of IT to become more efficient and more competitive. As indicated in the discussion of “Expectations from IT”, the CEO explicitly articulated the expectation that IT would improve the firm’s competitiveness against what were perceived as “bigger” and potentially more capable competitors from “outside”.

F.5.4.3 Business and IT Strategy

The CEO stated that the IT strategy was formally articulated as part of the firm's competitive strategy. He did not offer any information however, on the nature of the strategy development process and how the IT strategy was developed and implemented.

F.5.4.4 Staff Training

While the CEO did not elaborate on the specific nature of training undertaken to improve competence in using IT, he did indicate that the firm had been providing IT training. Specific reference was made to training for managers, as mentioned in the earlier discussion of Management Attitudes. This, the CEO felt, had provided immediate benefits.

The CEO also indicated that the firm provided IT-related training for staff because of the difficulty in finding suitably skilled persons.

F.5.5 Content

F.5.5.1 IT Applications Available

The CEO summarized the Group's IT infrastructure as follows:

“We now have a wide area network in place so from a financial reporting point of view all the reporting from the companies back to head office is done electronically now through that wide area network. We have an intranet where we can share information and messages on an internal email system and we are working towards commonality in the back office using ACCPAC which is an accounting module that we are using throughout the group now and in the context of the Food Group the entire Food Group is being integrated electronically from front door to back door with sales, from back door back to distributor for ordering.”

Although the individual business units largely have their own IT arrangements, the above represents the “firmwide” infrastructure that is being created as part of the effort to derive greater competitive benefit from IT. The above suggests an emphasis on applications that facilitate communication and integration throughout the firm.

4.5.5.2 IT Experience to Date

In commenting on the firm's recent IT thrust, the CEO did not characterize any specific activities as successes or failures, but instead stated that the efforts were in the “embryonic stages”, having started about 2 years before. He anticipated that results would start to show in another 12 months or so. With regard to the major IT upgrade project for the Food Group within the firm, he indicated that activities were “on track”.

F.5.5.3 IT Difficulties

One specific difficulty identified during the interview was the inappropriate use of IT systems by managers. The CEO felt that some managers were not using the reporting capabilities in an effective way and that this defeated some of the purpose of introducing the systems. He explained this as follows:

“I think on the negative side you have to be very, very careful that the managers understand the process, understand the reports that are capable of being generated and are selective in the reports that they read or they generate. I think there can be a lot of problems with having systems and just generating reports which means that instead of having less paper you have a mountain of paper on your desk and you are so inundated by it that you tend not to do anything so I think it is a plus and a minus. On the minus side we have to be very careful and very selective in the information that we produce from the information technology available to us and then you have to train managers to use the information in a proper manner.”

F.5.6 Summary

Although under the circumstances only a comparatively short interview was possible and this did not allow for detailed discussions of the firm’s IT experience and activities, the range of topics covered was sufficient to develop an understanding of how the CEO perceived the role of IT within the firm. It is evident that he had great confidence in the ability of IT to contribute to the firm’s competitiveness and he explicitly identified increased use of IT as one of the strategies that were being pursued in order to address the perceived increased threat from non-Caribbean competitors.

Within the senior management of the firm, there was support for the IT thrust. There also appeared to be good receptivity to the introduction of IT at the non-management levels. Interestingly however, the middle management seemed to be the group that was of most concern to the CEO, with their inability to effectively use the available IT tools appearing to be a bottleneck. This was being addressed to some extent by training, and the CEO reported that there were “immediate results” in cases where managers had been trained to use systems properly.

The CEO gave some indication of specific IT systems that had been or were being implemented to bring about the desired benefits. There appeared to be a focus on systems to support greater integration, communication and collaboration throughout the firm. He did not however, offer specifics on how the IT investments would bring about the improvements. His statements pointed to an expectation that increased use of IT would bring about improved efficiency, improved information, better decision-making and consequently increased competitiveness.

In general however, with regard to the Internal Context, the firm appeared disposed

towards increased use of IT to support competitiveness. While it is not possible to determine how successful the firm's IT efforts have been to date, one can conclude from the discussion that the CEO will use his influence to continue to promote use of IT as a competitive tool.

F.6 Firm E – Interview with CEO

F.6.1 Background

Firm E is a banking firm with branches throughout Barbados. It is a subsidiary of a Trinidad-based financial services firm. The sole interviewee was the CEO and he described the business of the firm simply as “to buy money and sell money”.

The CEO reported that he had been with the bank for approximately eight and half years, all of it in the CEO position. The bank had a staff complement of approximately 150 persons. There is an IT Department but at the time of the interview the position of IT Manager was vacant, with the bank expecting to hire a new manager in the near future.

F.6.2 Internal Context

F.6.2.1 Management Attitudes

The CEO expressed a generally supportive attitude towards IT use within the bank and in fact appeared to be directly involved in the IT planning and decision-making. Despite being asked about the attitude of the senior management team on more than one occasion however, he did not provide a direct response to this.

On one occasion he described the senior management team's attitude as perceiving IT as a “black box”. In explaining this, he seemed to suggest that gender was a factor in determining the attitude:

“When you drive a car ... most women drive cars every day, but they never look under the hood. They only look under the hood when something goes wrong. About half my senior staff are female, so that ... IT is a black box, but they will be annoyed when it doesn't work right and I think there is a general acceptance and understanding that we need IT and it needs to work well”

He also spoke in generic terms (but not with specific reference to his management team) of the need for managers to understand “what the black box entails, what to follow-through with and what they have to do to make it work”. On balance, the CEO did not give the impression that his senior management team was highly supportive of IT as part of the firm's competitive strategy and this did appear to be an inhibiting factor.

F.6.2.2 Organizational Structure

Several characteristics of the organizational structure as described by the CEO appear to impact on its use of IT. The firm is divided into four business units and each unit is expected to take responsibility for its use of IT. This he explained, meant that if a particular business unit needs an IT feature, it must be able to articulate it. He acknowledged however that this was a difficulty presently because neither the units nor the IT Department necessarily have the capability to formulate the business requirement into a proposal “that the IT Department can work with”.

The position of IT Manager reports directly to the CEO and has for the past 10 years. According to the CEO, this came about, not necessarily for any “functional reasons” but because of “internal politics”. He further explained:

“The IT Manager felt that if he was reporting to the person in charge of operations, he was too far away from the centre and he wasn’t sufficiently important. So that created a difficulty, so they took a political decision that IT reports to the CEO. I perpetuated that when I came here ... I perpetuated it but by the same token I also think it was sensible because I think I understood IT better than anybody else”

The CEO was non-committal on whether the fact that the IT Department reported at this level has affected the level of contribution to the organization. He acknowledged that by reporting to him the Department could get more resources than if it did not report to him. During the discussion however, he did not give the impression that he believed specific benefits were being derived from that situation.

Another characteristic of the organization structure identified by the CEO was that it employed very few secretaries. He reported that there were only 3 executive secretaries in the organization and that “most people write and type their own letters”. This meant that all employees were expected to have a certain level of skill in IT use and it was a prerequisite for new hires.

F.6.2.3 Sources of Competitive Advantage

The CEO felt that the bank’s main source of competitive advantage, particularly with regard to non-Caribbean competitors, was its local knowledge. He explained:

“In a sense what you have is local knowledge and that is the only thing that you can leverage. You have to compete on basics and you have to decide where your market focus is and stick with it and you must bring something to the table that they don’t have.”

He also believed that the ability of his bank to make and implement it’s own decisions sometimes gave it an advantage over its multinational competitors who often had to wait for decision to be taking at head office level. This allowed his bank to respond and act more quickly than these competitors.

F.6.2.4 Effect of Age of Staff

The CEO saw age as making a difference in employees' attitudes towards, and use of IT, stating that "younger people embrace it, older people are a little more afraid of it". He made specific reference to the use of e-mail as an example.

He also felt that when older employees became accustomed to working in a particular IT environment, it was more difficult to get them to accept changes than it was with younger employees.

F.6.2.5 Attitudes of Non-Management Staff Towards IT

The attitude of the non-management staff was considered positive, with the CEO stating they "liked" it. He also pointed out that one of the recent changes was the move from a system character-based interface to one with a more user-friendly graphical interface. This was well received by the staff.

F.6.2.6 Source of IT impetus

There were many sources of impetus for IT initiatives within the firm. The IT Department however, was not considered a significant contributor in that regard. The CEO summarized the situation as follows:

"In many instances, the impetus for the IT projects has come from the demand side. Some of them have come from the customer ... some of them have come from the business owner. Some of them have come from me. Very few have come from the IT department."

He also expressed the view that the role of the IT Department should be primarily technical – one of assisting users in making greater use of the systems. He explained as follows:

"I think that IT needs to take the initiative in ensuring that the box runs ... and runs efficiently. I think that IT should be a technical department, and make certain that they run things well. I don't think... unless IT is being run by somebody who understands the business ... and traditionally has not been ... most times IT is being run by technicians who understand the technical areas ... they could tell you "this could do this ... this could do that" ... If I want a query ... someone will write the query for me ... The IT department are invariably the ones who understand the system and understand how to make the query work. But they can't tell me what I should query. So I think the biggest demand for ... and the functions of IT should come from the users, it shouldn't come from the IT Department. I think the IT department should always be involved ... to see that everybody is asking the right questions ... whether they're going to move in the direction you want ...but I think it should really operate on the user side"

F.6.3 External Context

F.6.3.1 Sources of Competition

The CEO described the main competitors as banks (both foreign and local) and credit unions (local). Mutual funds were also competitors and while small at present, were becoming an increasingly important factor.

There was also competition from international financial management firms – specific examples mentioned were UBS Paine Webber, Merrill Lynch and Prudential. These firms were offering services such as pension fund management in the local market and the CEO also suspected that they were offering personal banking and investment services to selected individuals.

The CEO also referred to “suitcase traders” – firms with limited or no physical presence in the local market but that send representatives to conduct business from time to time. He cited Citibank as an example and explained that it had returned to the local market about 2 years earlier, having left since 1983. According to him, Citibank “cherry picks” business, going primarily after large transactions. He also made mention of other such firms offering insurance products.

F.6.3.2 Changes in Competition

A number of changes in the competitive environment were identified during the discussion. Locally, the credit unions had become a much more significant threat and were growing. According to the CEO, they had also moved “from the back street to the front street” by locating themselves in similar areas as traditional commercial banks with similar facilities. Another Caribbean bank was identified as bringing new skills to the market in the area of “Design-Construct-Finance” (DCF) projects and “build-lease-own” projects that targeted the financing of high value construction projects. Local Mutual Funds were also identified as becoming more of a factor.

With regard to non-Caribbean competitors, the most significant changes identified were the increase in the “suitcase trade” and the increased interest shown by international financial management firms such as Merrill Lynch, Prudential and UBS Paine Webber.

F.6.3.3 Technology effects

The CEO acknowledged that the use of technology was having significant effects on the competitive environment. One of the topical areas mentioned was Internet Banking. While expressing doubt about the potential benefits of Internet Banking, he agreed that there was increased interest in such services. He also noted that successful delivery of such services could give competitors an advantage:

“One thing about it is the Internet ... It’s fancy to talk about the Internet as being a developer and so on. Internet makes sense if you’re living in New York and your account is somewhere else ...or if you want to accrue

numerous opportunities. But I think the surveys are beginning to show that a click strategy has to be supported by a mortar strategy. People want to be close. At the end of the day, whatever you do from an Internet perspective, you have to have the capacity to give somebody the ability to go in. So the Internet strategy ... we don't know if it's cost effective. I think it isn't ... I don't think Internet banking is cost effective at this stage of the game. But some Internet banking products maybe because there is a business need for it. That's something I think we need to spend more time focusing on. Whoever solves it first, has a good market possibly."

The CEO also spoke of an initiative by several banks in Barbados to introduce a facility that allowed customers to use each other's ATM machines. While his bank did not participate in this initiative, it introduced its own arrangements in order to minimize the expected advantage that the competitors would have derived.

F.6.3.4 Consumer Behavior

There were a number of ways in which consumer behaviour was seen as affecting the competitive environment. On one hand, the CEO believed that there was an increasing trend of local residents investing their funds abroad. This in turn attracted more competitors to the market.

Consumers' expectations were also changing, and this was partly influenced by their perceptions of what pertained elsewhere. According to the CEO, the customer wanted things faster and he wanted "more of the things he sees on TV".

These changes in consumer behavior were affecting the approach of this bank and its competitors towards providing services to their customers.

F.6.3.5 Competitors' Advantages

The size and scope of operations of the non-Caribbean competitors was identified by the CEO as one of the advantages of they possessed. According to him, "we cannot invent anything they have not already done". Better access to IT, because of the resources available to those competitors globally, was also perceived to be an advantage.

The ability of these competitors to offer more sophisticated products was also considered an advantage. According the CEO, the products offered in the local market were largely "undifferentiated" and he anticipated that competitive advantage could be derived from introducing new products:

"So there's a lot of room for increasing sophistication in terms of the products and so on ... and there are a lot of business opportunities there, now that I am talking to you about it, that we haven't paid attention to and we need to. The foreign ones are going to be able to do it a lot faster than we are, because all they're going to do is just bring in what they have from North America. Whereas ... I for example have to develop it and design it in-house or buy a package off-the-shelf and customize it."

F.6.3.6 Government Policy and Action

The Central Bank's policies and actions were considered by the CEO to be "a key driver" of some of the activities of his bank in the IT area. One of the IT projects in which his bank was involved, along with other banks operating locally, was an automated clearinghouse system for clearing cheques between banks. This was being implemented, because according to him, "they don't want us exchanging bags of cheques anymore". The CEO also stated that the automated clearinghouse system was to some extent being forced on the bank by the Central Bank.

The CEO expressed strong disagreement with the rationale behind some of the IT activities that the Central Bank required the banks to undertake as well as the manner in which the projects were being coordinated and managed by the Central Bank.

F.6.3.7 Public Perceptions and Expectations

The CEO agreed that public perceptions of the bank's use of IT were important. It was not only important to have good IT systems to deliver the necessary service, but it was also important to be perceived to have good systems. He explained this as follows:

"IT can offer you that perception, but it won't drive your business. At the end of the day, you can have the most advanced system in the world ... if customers don't think you do, then you don't. It starts and ends in the market. That's why I make the point, IT might be at the centre of your business, but it's not the first part of your business. The first part of your business is marketing - the ability to sell and the ability to position the organization as one that will deliver better than the competition. If you can't do that, no matter what IT you have, it won't make a difference."

He illustrated the importance of such perceptions with a description a situation in 1998 when most of the banks operating locally launched a "domestic switch". This allowed customers of each participating bank to use their ATM cards at ATM machines belonging to other participating banks. His bank did not participate in the domestic switch but instead joined an international switch "piggy-backing on VISA". His bank was able to launch this several months ahead of the domestic switch and provided what he considered to be two advantages: (a) it provided the first local comprehensive debit card product and (b) the bank's cards could be used at all ATMs.

In spite of these advantages, the launching of the cards did not help his bank because customers perceived that they were "behind", since they were not part of the local switch. While the CEO felt that the above situation illustrated his bank's ability to move at its own pace, he also conceded that the customer's perception of the bank's use of IT was important. It was important that his bank was perceived as being "stronger or as strong as the other banks".

F.6.3.8 Other External Constraints

The relative shortage of persons with IT management skills and specialist knowledge of the banking sector was identified as a constraint for the bank in making greater use of IT.

F.6.4 Process

F.6.4.1 IT Development Over Time

The CEO's statements about how the firm's IT had developed over time suggested that the developments were not driven by specific strategic objectives, but rather by technical and operational needs as explained below:

“The IT department initially moved in a particular direction because we had run out of space. We had run out of size, and we upgraded. As a result of the upgrade, then we had to change our mainframe system. So I guess you can say it is because of business demand, but the impetus came from the IT side of it. Since then it's been a matter of refining that system to make it user friendly or to fulfill our business requirements. So I would say the initial impetus came from the IT side, and it was a problematic and programmatic response to a business need. And the business need is to keep good information, and to keep your information system up and running. But after that I would think it would be in a sense, all user demand.”

Note that “space” in the above statement actually refers to system capacity.

F.6.4.2 How IT Managed

The firm has a Computer Steering Committee that is chaired by the CEO. It provides a forum for user departments and the IT Department to discuss ongoing IT issues of both a technical and non-technical nature. This committee had been in existence for 3 years and represented an effort to bring about increased focus and discussion of IT use.

The CEO described each of the bank's four business units as being responsible for their own IT. This appeared to have more to do with determining their IT needs and obtaining services from the IT Department as opposed to providing or sourcing their own IT services. It therefore appeared that IT service provision was mainly centralized.

The position of IT Manager reports to the CEO. At the time of the interview however, the firm had been without an IT Manager for about 6 months. It was not clear what structure existed within the IT Department, and it appeared to be in a transitional state, with a new IT manager expected to join the firm in the near future. In the interim, the CEO reported that the IT function was partly being run by a team of consultants. The CEO also appeared to have a significant role in the provision of IT

services within the firm.

F.6.4.3 Role of IT

The CEO saw the role of IT as that of an “enabler”, to make the bank’s operations more efficient. He summarized his perspective as follows:

“IT is an enabler, its job is to make things work or to make things work faster. You want to become more efficient. You want to become more proactive and you want IT to basically give you information which you didn’t have before or which you had in somebody’s head but not in a system and technically a managerial response team. Effectively, the way the bank is broken up you have effectively promise keepers and promise makers. Your promise keepers are your people in the back office, your promise makers are your front office people who interface with staff on an ongoing basis, they are to keep the promises effectively ours is the grand value package. What is the value that you bring to the market? Our value package is built on speed and convenience and local knowledge. We will be friendly, we’ll be polite, we’ll be efficient and we will get the job done, that is effectively what we are saying and we will do it faster than anybody else. For that to happen you have to make certain that your back office is perking, that your IT works well. IT in a sense is an enabler, it is a promise keeper not a promise maker.”

He therefore saw IT as primarily providing operational support as opposed to providing a competitive advantage to his bank.

F.6.4.4 Competitive Responses

The main response that the CEO believed was necessary to respond to the perceived changes in the competitive environment was new product development. He stated that in the Caribbean, as compared to North America, the banks offered “undifferentiated” banking products and that needed to be changed. The greatest room for improvement he felt, was in pension and personal investment products. In general he felt there was need for more sophistication in the products and services being offered to customers to remain competitive with the non-Caribbean firms who had greater experience in offering such products.

F.6.4.5 Business and IT strategy

The CEO did not make it clear whether or not the firm had a documented business strategy. While it had some general targets, he stated that it did not have a documented IT strategy. According to him, part of the problem being faced presently was “perhaps too much of the IT strategy is in my head”.

F.6.4.6 Staff Training

The CEO reported that the firm has arranged training for all staff in use of the Microsoft Office products during 1997-1999. There had also been extensive training

provided for staff when the bank introduced a new “frontline” system in 2000. There was no mention however, of an ongoing and sustained training programme to allow staff to make the best use of available IT resources.

F.6.5 Content

F.6.5.1 IT Applications Available

Apart from general references to applications (such as the “frontline” system), the CEO did not provide much information on specific applications used by the bank. It was evident from the discussions that the bank used the Microsoft Office products for general administrative tasks as well as having specialized software for banking activities.

Internet access was also available, but evidently not widely used within the bank. Presently about 25 persons within the bank had access to the Internet but the CEO felt this was too high a number.

The CEO also spoke of efforts to develop an Intranet “to move information about the organization and within the organization”. At times during the discussion however, he gave the impression that this was partially functional, while at other times he gave the impression it was not yet functional.

F.6.5.2 Experience with IT to Date

The matter of the bank’s experience with IT to date came up at several points during the discussion. In some cases, the CEO’s views on the experience appeared to be contradictory. For example, in commenting on the level of satisfaction with the results of the bank’s IT investment to date, he stated:

“I am getting what I can reasonably expect of it but I am not necessarily getting what I want. We are 3 years behind in terms of our IT strategy in terms of what we wanted to do.”

It should be noted, as mentioned earlier, that in response to a subsequent question he indicated that there was no documented IT strategy and that the strategy was “in his head”.

Later during the discourse on experience with IT to date, the CEO stated:

“So in terms of us getting what we want, the answer is yes, I think we are doing OK. Are we getting it at the right price ... are we getting the right quality? I think we are getting the quality but not the price. I think it’s too expensive. I think IT in this part of the world is very expensive ... and the telecommunications costs with it are huge. We are probably not doing as well as we should.”

In general however, the responses during the discussion suggested dissatisfaction with

the way IT was being implemented and used, and the results that were obtained.

F.6.5.3 IT Successes

The CEO considered the introduction of the “front end” system in 2000 to be one of the notable IT successes for the bank. The system had been reasonable “robust” and had not had significant downtime. One of the reasons for his satisfaction was that a major international competitor that had implemented such a system was receiving significant customer complaints as a result, while his bank did not have that experience.

F.6.5.4 IT Difficulties

The CEO did not cite specific projects or IT systems as failures but alluded to several difficulties experienced with the implementation and use of IT within the bank. Several of these seemed to stem from, or otherwise involve dissatisfaction with the management of IT, as opposed to specific technical issues. While he did not state the circumstances under which the IT Manager had left about six months earlier, it became clearer as the discussion progressed, that he had been dissatisfied with the performance of the IT function under that manager. The following extract is perhaps the most appropriate summary of the CEO’s sentiments on this matter:

“I would say that one of the biggest factors leading to the departure of the last IT manager was precisely that we had too many things going wrong ... too many small things ... things that you had to keep following up. I would say the difference between six months ago and now, I would say that my Steering Committee meeting is not about this printer not working, or we not getting this to come in ... we know that some of those things are happening, but those are not the questions that come up at the IT Steering Committee meeting. We don’t have questions about whether your staffing is right ... about whether you should fire that person or not. The reason why these questions came up was that there was a clear level of dissatisfaction, a clear level that the internal customer was not being satisfied ... and that IT was not responding to the internal customer ... did not give an adequate internal customer response. That was what was coming through. The fact that my IT Committee meeting no longer has that, it tells me the basic are on-stream and we are doing the right thing ... looking at other projects that will make the organization perform more efficiently. If I have to use any yardstick at all ... from an anecdotal perspective, it’s the fact that the quarrels we have now are about what else we can make the system do. It’s not about the system is not doing this. So that tells me that it is operating at a reasonably good tolerable level at this stage of the game.”

As mentioned earlier, one of the consequences of the difficulties was that the firm was 3 years behind on the implementation of its IT “strategy”.

F.6.6 Summary

In general, the picture painted by this interview was that of a firm recognizing the importance of IT but facing some difficulty in getting the IT implemented and used in the most effective way. Despite the CEO's apparently strong interest and direct involvement in the firm's IT implementation, the Internal Context of the firm does not appear very favourable for increased use of IT to improve competitiveness.

In particular, there are no indications that senior management other than the CEO are very supportive of IT initiatives. The organization structure also does not appear to be favourable, in that, while there seems to be some decentralization of responsibility in determining IT needs for each business unit, the IT resources are centralized and there is little indication that the business units have the capability to articulate and champion their needs.

The source of impetus for IT initiatives is also unclear. While the CEO appears to be a driving force, his comments suggested he was more involved in day-to-day management of the IT function than in developing a vision for the role of IT in the organization.

Indications are that the bank's external environment is becoming increasingly competitive, with the threat from both Caribbean and non-Caribbean sources increasing significantly. The local credit unions are expanding into the traditional markets of the commercial banks while increasingly, global financial management firms were being attracted to the local market. The CEO has recognized the need to respond to these threats, but while acknowledging that IT can assist the bank to become more competitive by becoming more efficient in its operations, he did not identify a clear role for IT as a competitive tool. There were indications that he was also unhappy about being "forced" by the Central Bank to implement certain IT systems as part of its efforts to regulate the local banking system.

The overall process of IT implementation, management and use does not appear highly focused on deriving competitive benefit from IT. While there is a Computer Steering Committee that provides a forum to address user issues, it appears to be preoccupied with resolving operational problems, although the CEO pointed to changes in that situation. Also, with the temporary absence of an IT Manager, it was not clear how the overall IT function was being managed and supported. The bank had engaged consultants to provide IT services, but it was not clear whether this was the full range of services that would normally be provided by an IT Department.

The discussion did not identify the specific IT applications being used by the bank or the extent of IT use. Also, although there was not much said about specific project failures and difficulties, the CEO appeared very dissatisfied with the way IT was implemented and managed under the previous manager.

F.7 Firm F – Interview with Director

F.7.1 Background

Firm F is a small civil and structural engineering consultancy business. The company is wholly-owned by the Director and at the time of the interview, it had been in operation for approximately 18 months. In addition to the Director, the firm had 4 full-time employees. It also engages other engineering professionals on an assignment-by-assignment basis from time to time according to the demands of specific assignments.

F.7.2 Internal Context

F.7.2.1 Resources

The level of resources available was generally a constraint for the firm and directly impacted its use of IT. As a small firm, Firm F found it difficult to compete for larger contracts and as such for the time being limited itself to competing for the smaller jobs. Financial constraints also prevented the firm from investing in IT, as explained by the Director.

“I think we haven’t invested enough in IT because we have not had the cash flow to do it. I think that if we invested more, we would make strides faster. For instance we have not got very large structural jobs to do, so the structural jobs that we have on hand, we do them manually or do them using simple software packages. As opposed to the real heavy-duty packages like Studs which are expensive, so it means that we are not developing. We are not having these more powerful design programs at our fingertips yet. We are not getting enough IT in fast enough.”

The Director felt that in general, the high cost of specialist engineering design software such as AutoCAD limited the extent to which the firm could use these tools. As indicated above, he also felt that the inability to invest more in IT was preventing the firm from developing its internal capabilities.

F.7.2.2 Management Attitudes

The Director, who was almost exclusively responsible for decision-making within the firm, exhibited a very positive attitude towards IT during the interview. As has already been indicated, he strongly believed that the firm should make greater use of IT, stating that “we are not getting enough IT fast enough”.

F.7.2.3 IT Competencies

The Director’s knowledge of IT as well as existing IT competencies among the staff significantly influenced the decisions to invest in IT. The Director felt however, that because in some instances he “knew what the technology could do” but could not use it himself, the staff felt that the technology was being imposed on them, leading to some resistance in learning how to use specific computer packages.

F.7.2.4 Sources of Competitive Advantage

The Director believed that the firm's use of technology had contributed to its competitive position, although he expected the advantages derived to be short-lived. He cited examples of technology – both hardware and software, that had reduced the time it takes to complete certain types of tasks. For example, use of “roll feed” plotters as opposed to the more common “sheet feed” plotters allowed the firm to print drawings unattended, thereby reducing the labour requirements. Similarly, use of a special software package that calculates the material requirements directly from reinforced concrete drawings had given the firm a temporary advantage as only two local competitors were known to have similar software – all the others did these time-consuming calculations manually.

F.7.2.5 Expectations from IT

The Director summarized his expectations of IT by stating that “what we've been trying to use the IT to do is to get ourselves more efficient so that we can get more moving to the bottom line.” While he did not elaborate on that specific statement, several statements during the interview suggested that the main expectation was that IT would reduce the time required to undertake critical tasks and consequently reduce both the time and cost of producing the firm's output.

F.7.2.6 Non-Management Staff Attitudes

The staff was generally supportive of the use of IT. The Director believed however, that because in some cases he was not personally familiar with the applications that he was introducing to the firm, the staff felt those applications were being imposed on them. He spoke of a specific instance where a potentially time-saving application was introduced during a project which had tight deadlines. There was some resistance from the engineer who needed to use this application because according to the Director, the employee felt that having to learn the application would reduce his productivity while he was under pressure.

F.7.3 External Context

F.7.3.1 Sources of Competition

The Director was able to offer a concise summary of what he perceived to be the competition for his firm. He expressed it as follows:

“Our main competitors are similar firms - other civil and structural engineering consultants, and for the most part, Barbadian-based consulting firms. There are about 16 or 18 such firms in Barbados and we have been looking at competitive environment, not just in terms of the present but in terms of where we want to be in 10 years time; So we've been focusing on the larger players in the market in terms of how we think of competing ... so we haven't done a full count, but of these 16 or 18 firms most of them are small outfits; very often it's just the principal and 1 engineer or the principal and a technician and a secretary or just the principal on his own; most of these firms have been around for a long time and you can tell, the

small firms - their strategy does not include growing; and then there are some larger outfits; there are 4 large outfits that we have been watching and trying to predict their own strategy and their own future; for us, our future looks good because we can see that one of those firms is going to eventually “peter out” because they haven’t been ... their directors are all fairly old and one is retired already and they haven’t been bringing in any new blood and we see how we can compete against the other 3 firms.”

The competition consisted primarily of local firms offering similar services to that offered by Firm F. While there had always been and continued to be competition from non-Caribbean firms, especially on larger contracts requiring international experience, the Director did not consider the non-Caribbean competition to be a particularly significant factor. He also pointed out that to some extent the firm competed with entities such as architectural firms that offered project management services, but that it avoided such competition because he considered these firms his “allies” in terms of providing work.

F.7.3.2 Changes in Competition

The Director believed that the most significant change in the competitive environment in recent times was a perceived reduction in the level of differentiation among firms. He explained as follows:

“I think in the market overall, there has been less and less differentiation over time. If you went back say 10 or 15 years and you were a client looking to choose an engineer, you would see distinct differences between the quality of the output, between the experience and capability of firms, and so on. What has happened now is that it was not a commodity yet but the service we provided has moved closer to being a commodity and for a well-informed client, depending on the nature of the project, he can get as much value out of the one guy operating out of his spare bedroom as he can out of the larger firms and sometimes he can get more value. A lot of it has to do with the fact that there are a lot more younger ‘whipper-snappers’ available who are very familiar with the current technology and a lot of the stuff now is easier to do and faster to do because of the available software. You still need judgment and so on but if you get the work churned out. There’s not as much differentiation among the firms.”

He was clearly of the view that use of IT within the profession has changed the nature of competition.

With regard to the non-Caribbean competition, the Director stated that a recent development was that a non-Caribbean firm had bought out a local firm, giving that firm a foothold in the local market. Overall however, he did not believe there was much change with regard to non-Caribbean competition.

F.7.3.3 Technology Effects

As indicated above, the Director believed that IT had plays a significant role in

defining the competitive environment for his firm. According to him, it was now easier for everyone to produce the same work because of the use of IT. As the technology was widely available and relatively affordable, “the minimum standard of work required by any player is now higher”. Consequently, it had become increasingly difficult to compete based on quality of work.

F.7.3.4 Sources of Competitors’ Advantage

The Director believed that the non-Caribbean firms tended to have an advantage over the local firms on larger projects, which were the most lucrative projects. This was because they were better able to satisfy the criteria for bids on such projects – particularly the requirement to show experience in similar projects.

He did not indicate however, that these firms derived any of their advantages from the use of IT.

F.7.4 Process

F.7.4.1 IT Development Over Time

The firm had been in operation for approximately 18 months at the time of the interview, and according to the Director, had used IT “from Day 1”. The Director did not report any significant changes in the way IT was used or deployed over this period.

F.7.4.2 How IT Managed

The firm had no separate IT management function, and in general, the Director made the decisions regarding the acquisition and use of IT resources. Such decisions are based on the Director’s judgment of the value the firm will derive from the IT resources when compared to the cost, as well as the firm’s financial position. There was no indication however that any formal cost-benefit analysis was undertaken.

Installation of hardware and infrastructure such as network cabling, as well as hardware support, was outsourced. According to the Director however, the firm generally relied on the software vendors for application support.

F.7.4.3 IT Role

The Director saw the role of IT as allowing the firm to become more efficient so that it could reduce its costs and improve its “bottom line”. While he gave examples where the use of IT had improved the firm’s competitive position, he did not believe that these advantages were sustainable because the same IT resources were available to the competitors. He therefore did not consider providing competitive advantage to be part of the role of IT within the firm.

F.7.4.4 Competitive Responses

During the discussions the Director identified three strategies that the firm was implementing or needed to implement to cope with the current competitive environment. Firstly, because the availability of technology was perceived reduce the differentiation in quality of work, he believed that the firm should focus on developing relationships and improving performance. He explained as follows:

“It is difficult to compete based on quality of the work. A lot of the competing will be done on relationships, how effective you are perceived to be at getting things done. It’s not just a matter of churning out the drawings or design details or what have you. It’s a matter of how good is your implementation, how easy you are to work with, who you know. The relationship aspect is key. The way to compete these days is going to be through building relationships. Doing good proposals. Delivering projects effectively but also within the budget. Budgets are a lot more important than previously. And within time.”

Secondly, he believed that the firm had to improve its efficiency, taking advantage of IT wherever possible.

Thirdly, the firm would focus on specific market segments and types of projects where it believed it had the best chance of success.

F.7.4.5 Business and IT Strategy

The firm did not have a formally articulated business strategy. According to the Director, “we have talked about it but have not actually committed anything to a document”. He explained that the firm had a strategy but had not yet written it out.

While the firm did not have formal strategy documents, the responses suggested that considerable thought had been given to the issues of how the firm would compete and how it could use IT. For example, in responding to a question on the strategies required to address the firm’s competitive environment, the Director outlined the following:

“In terms of our strategy, just to give it to you in a quick nutshell ... we have broken the market into segments and we have decided on the order that we are going to tackle those segments. It’s private sector first, and we have the private sector split into subgroups, so we are working on the private sector first through the architects, because they are the consultants that often get the work for us and other consultants, and then through direct approaches to prospective clients in the private sector. We are working steadily toward developing a strong presence in the private sector. And then after that we are looking at the public sector but at what I call the “below the radar” end of it. The projects that are less than \$100, 000 where they don’t need to go out to competitive bidding...Dealing with technocrats within government. And finally, the last area we are going after are the ones where you have to compete against international firms,

or even compete against local firms ... where you have to compete on the basis of proposals. We will put them in as they come along, but it's not our main thrust."

F.7.5 Content

F.7.5.1 IT Applications Available

The firm uses specialist engineering applications for its core activities. Specific examples mentioned during the discussions included AutoCAD for preparing and printing engineering designs and a package for calculating the steel requirements for reinforced concrete structures using design parameters extracted from AutoCAD. The firm also uses Microsoft Project for its project management activities. All the applications being used were readily available "off the shelf".

An office productivity suite is being used for day-to-day administrative tasks such as preparation of correspondence, and maintaining a database of contacts – primarily customers and vendor. At the time of the interview however, the firm's accounting was outsourced.

All of the firm's applications were run on a PC-based local area network.

F.7.5.2 Benefits realized from IT

The main benefits the firm had realized from IT was the reduction in the time and manpower required to undertake certain tasks. Two specific examples cited by the Director were (a) the reduction in time to prepare the schedules of steel requirements for reinforced concrete structures resulting from use of a software package that could prepare these schedules automatically from engineering designs and (b) the reduction in the number of man-hours required to print engineering drawings obtained by using a "roll feed" plotter that could be run unattended as compared to using a "sheet feed" plotter that required an attendant to change the sheet after each print job.

F.7.5.3 Potential of unrealized benefits

While the firm had acquired Microsoft Project to support the management of its projects, the Director indicated that it was not being actively used. This, he explained, was because "we didn't set it up in the easiest way to manage our work". The firm had not been able to keep the project information updated, although the Director expressed the intention to continue using it.

The firm was now attempting to build a database of contacts to be used for various purposes. It was also hoping to stop outsourcing its accounting by acquiring and using an accounting package in-house.

F.7.6 Summary

The Internal Context of this firm appears generally favourable for increased IT use although this is negated by the lack of resources identified. The management of the firm in the person of the Director, is highly supportive of the use of IT, and evidently has sufficient competence in IT to identify applications that are potentially useful to firm. While there are indications that the attitudes of staff towards IT use have caused difficulty on some occasions, the attitude is generally positive.

The discussions indicated that the Director had a clear understanding of his competitive environment and how it had changed over the years. He was able to articulate fairly precisely who he considered to be the firm's main competitors and what level of threat they represented. Further while the firm did not have a formally articulated business strategy, there was evidently a carefully thought out plan for developing the competitive position over time.

IT appears to be an important factor in this firm's operation for a number of reasons. Firstly, the Director believed that his firm had derived specific advantages over its competitors through its use of IT, although he expected those benefits to be short-lived. Secondly, he believed the increased use of IT accounted for what he identified as the most significant change in the competition in recent years – the reduced differentiation among competitors.

F.8 Firm G – Interview with Managing Director

F.8.1 Background

Firm G is a commercial bank based in St Lucia. It is referred to as an “indigenous” bank, which in the Caribbean, simply means that it is locally owned. The bank was one of the first locally owned banks to be established in the Caribbean, and in the past promoted itself as the bank of choice for the lower socio-economic classes who felt they were not being properly served by the mostly foreign-owned banks.

It is a public company and currently operates at five locations in St Lucia. It only operates in St Lucia. The bank has approximately 75 employees.

An interview was held with the Managing Director (MD), who is the bank's chief executive. He had been with the bank, and in the position of Managing Director, for approximately 3 years.

F.8.2 Internal Context

F.8.2.1 Resources

The bank's willingness to commit resources to increased IT use has had a significant impact on its use of IT, as this allowed it to overcome other constraints. The MD made specific reference to this with regard to overcoming the limited availability of suitable persons locally to support and deploy IT systems for the bank. He explained:

“Sometimes you may wish to have better response times from technicians, sometimes you may wish that local technicians were more knowledgeable. But that’s another issue. It doesn’t constrain you. What it does, it costs you more to bring a guy from Barbados, but it doesn’t constrain you. You need it. When we had to install our IT, to upgrade our system last year, we had over 12 people from a firm called Jack Henry in the States here for over two weeks, going through the entire system and migrating one to the other and upgrading. That cost us a pretty penny, in addition to the hardware, but you know ... but do you think we could go along without doing it?”

Therefore, the willingness and ability to commit the resources affected the use of IT for competitive purposes.

F.8.2.2 Management Attitudes

The MD exhibited a very positive attitude towards IT and stated that the senior management team was also very supportive of IT. He described their attitude as “excellent”.

From a personal perspective, he described himself as a “gadget buff” and someone who was always interested in new technology. He also pointed to himself as setting the example in using IT. He made clear his expectation that managers would not only support but also lead in IT use:

“ ... if you have a management who are not appreciative of the changes and the benefits that can flow from IT, you have a problem. You need managers and leaders, and if you cannot lead in that area, then you should cease to be a manager. I certainly hold that view. As far as the other staff are concerned, the much younger ones they come into the system expecting that you have a certain level of IT here, which, some of them have come in, having worked with other banks, and I am pleased to say that I have taken on some people from a few other banks and they have said that our system is easier ... and one of the tests of a good IT system is if it’s user-friendly, isn’t it.”

He also pointed out that the management team was relatively young, with him being the oldest manager. He believed that this contributed to the positive attitude.

F.8.2.3 Expectations from IT

The expectation generally articulated by the MD was that IT would make the bank more competitive and would allow it to survive in an increasingly competitive market. IT was also expected to support efficiency and hopefully cut down the number of hours worked, as he explained:

“We invest in IT (a) to remain competitive (b) to remain efficient and we had hoped to cut down on the number of hours that we worked. I can only assume that if we didn’t have it we would be working longer hours,

because the demands that people make on you now are so great, that you cannot ... people are so impatient for service now ... in other words, you have to be at the cutting edge to meet the demands of your customers. You can only do this with IT.”

He also alluded to the bank’s ability to issue credit cards and improved communication through IT-based media as ways in which this could be achieved.

F.8.2.4 Effect of Age of Staff

The MD perceived age as a factor in determining acceptance of IT within the bank. This applied to both the management and general staff body. In comparing the attitude of the management team towards IT with his, he stated:

“As a matter of fact, it’s like they can’t get enough of it. There is a perception that younger people are hungrier for IT than older people. I am the oldest person in this bank. So you can imagine how the younger ones are lapping it up.”

Similar reasoning was applied to the rest of the staff. In general, he was of the view that his bank was in a better position to adopt IT because of a relatively young management and staff body.

F.8.2.5 Non-management Staff Attitudes

The attitudes of the non-management staff were also considered to be positive. Here again, age was considered to be a factor, with the MD referring the “much younger ones” coming to join the bank and expecting a “certain level of IT”.

F.8.2.6 Source of IT Impetus

The MD identified the senior management team as the ones driving the IT agenda within the firm. While he did not explicitly identify himself as one of the main driving forces, several of his comments during the interview pointed to him as being directly involved in and highly supportive of efforts to make greater use of IT within the bank.

F.8.3 External Context

F.8.3.1 Sources of Competition

The MD described the bank’s competitors as “any institution wanting to offer services that we do ... to the public, either holistically or segmentally”. In addition to traditional banks, he cited credit unions, insurance companies, non-traditional finance companies and even government institutions that offered financing under special social development programmes. He considered the government institutions to be competitors because they offered a service that had been regarded as this bank’s area of strength – lending to the “small man in small amounts”.

The bank faced competition from both Caribbean and non-Caribbean sources but the discussion suggested that the MD perceived the Caribbean competition to be more significant. He cited the example of an insurance company offering to take deposits from customers and to lend funds to customers as an example of the type of competition faced. Particular attention was also drawn to the role of a larger local bank that the MD considered to have much bigger “aspirations” than his.

F.8.3.2 Changes in Competition

The MD identified some perceived changes in the characteristics of the competition that had taken place in the recent years. One of these was increased competition from non-traditional sources, among them, insurance companies and government institutions. He explained as follows:

“In the sense that the insurance companies, and one case I can think of locally ... they have been going straight to the public, and offering deposits ... offering to take deposits from them at higher rates than they would get from banking institutions, or indeed making loans to them. That is in direct competition to what we do - we raise funds and lend funds. Anybody doing one of these is in direct competition with us. That has escalated because as the market has grown, or other players have seen it to have grown, there have been additional competitors in here. The credit unions have become a little more aggressive and even government agencies or pseudo-agencies have become players too ...”

He was of the view however, that the foreign dimension, “in its pure form”, had decreased. He explained this in the context of a recent move by two international banks to merge their operations into a new regional entity.

“... well, as a matter of fact you notice there has been a “merger” of Barclays Bank and CIBC. The significance of that is not the merger, but the withdrawal of the brand of Barclays Bank and CIBC from this region. That is a very significant thing that most people have missed. They see it as a merger rather than seeing it as withdrawing the brand. So to answer your question ... the foreign component has disappeared by this happening, because what has happened in fact is these two companies have taken an investment in a new entity. So what we’re left with, is the Royal Bank of Canada, which is still undecided about what it’s future is going to be in the region; then of course our good old friends Scotiabank, they still remain. So the foreign element has diminished in a certain sense, although it has been replaced by an entity which is supposed to be Caribbean hence the name First Caribbean. But then on the other hand, we’ve seen a big influx of the International Business Companies [IBCs] and we have opened up our region to that kind of possibility.”

While the MD identified IBCs as a new source of competition, he subsequently indicated that he did not believe they would be a significant factor.

F.8.3.3 Availability of External Support

Availability of external support locally was a factor in the bank's use of IT, but the MD did not consider it a constraint. He considered it primarily a cost issue as to overcome it, the bank had to bear the cost of obtaining support overseas. He cited as a specific example, a recent experience where then bank hired a US-based company to perform on-site upgrades at the bank's premises over a two-week period. While this cost the bank "a pretty penny", the MD did not think the bank had a choice but to make that investment.

F.8.3.4 Comparison of IT to Competitors

The MD felt that the bank's available IT compared very favourably with others operating locally and made explicit comparisons in that regard. He emphasized in particular, the fact that the main application system used by his bank was the same as that used by the other much larger locally-owned bank. According to him:

"... Now if you consider that and you understand that the system that we have in place is the same one, serviced by the same people, then you understand that our system is not backward in any way, and our system, I know for certain, is better than Barclays, and the people at CIBC have a good system, but it's almost like this one."

His comments suggested that he considered it important to have an IT system that was on par with that of the competitors.

F.8.3.5 Government Policy and Action

Government policy and action had some influence on the bank's use of IT, but the MD did not consider it a significant influence. The most important government agency in this regard was the Central Bank, which was responsible for regulating the banking system. According to the MD, in recent years, the Central Bank had been making increasing use of IT and it was now the practice to submit required statistical information to the Central Bank electronically. He felt that in order to "keep pace", the commercial banks had to "join in". He did not give any indication however, that the Central Bank had mandated any particular level or form of use of IT by the commercial banks.

F.8.3.6 Public Perceptions and Expectations

The MD acknowledged a link between public perception of the bank and its use of IT, suggesting that there was a positive effect on customers' perceptions. In response to the question about whether the use of IT was seen to affect such perceptions, he responded:

"Yes. Customers come in here and they don't even know, because, like I said, it's seamless. And I'll tell you this - some customers are surprised that we have such an advanced system. In fact, this is one of the things ... and that is merely parochial ... that I have been trying to battle here. It's the question of the perception of this bank. Because there are certain

perceptions associated with the “penny bank” which I would like to dispel, because we stopped being a penny bank a long time ago. You know what I mean. And people do not understand it. I don’t know if it is that they do not understand it, or prefer to hang on to it for their own benefit ... but we stopped being a penny bank ... and you’re right, it has been a challenge at some times, to dispel the notion, or to put another way, have people appreciate, the kind of technology that goes into the service and meeting of their needs and wants.”

Although acknowledging the link as stated above, he did not give any indication that this had a significant impact.

F.8.4 Process

F.8.4.1 How IT Managed

The day-to-day management of the IT function within the bank is the responsibility of the Operations Manager. According to the MD, the incumbent was “fully trained in IT” and also had several years of experience in banking. The MD also indicated that the Operations Manager had a technical staff reporting to him, and expressed the view that “his level of expertise is good enough that I can have a certain comfort level”. He did not elaborate however, on the size of the IT department or offer provide details of how IT management decisions are made.

F.8.4.2 Role of IT

The MD saw bringing about improvements in efficiency of operations as being part of the role of IT within the bank.

“As simple as it sounds, but efficiency almost bears down on you, in an IT world. That’s basically where we’re at. So our idea is to watch the needs of our business, watch the needs of our customers, and if we require ... no doubt, it has been proven that we need IT to bridge that gap most of the time.”

He also saw IT as having a significant role in enabling the bank to more competitive, and for that matter, surviving the competitive environment.

“In terms of remaining competitive ... if we had lagged in IT while the others went ahead, we would not even be talking about being competitive, because there is no way ... you know. You’d be entering things by hand while people were punching keys. But we remain competitive and IT makes us competitive. We are able ... I can sit at my desk and use the intranet and talk to our staff, and all this is possible with IT. So rather than having to run downstairs, for example, and having to ask a personal question, or asking somebody to come upstairs to have a discussion, we can have a discussion on the thing. So, it makes you more efficient ... it causes people to work ... But interestingly, I was only remarking quite recently that computers and IT were supposed to have created a paperless office. I am still waiting for it, actually. [laughter].”

F.8.4.3 Competitive Responses

The MD identified “staying close to your market” as the primary strategy that he considered necessary for responding to the perceived changes in the competitive environment. He suggested that because the foreign banks moved their staff around a lot more, the staff of the local banks may have better knowledge of the specific markets in which they operate. He also identified the “cut and thrust of the local economy” as an important factor affecting the business of banks, and as such “when things are bad, you have to understand how to deal with it”.

F.8.4.4 Business and IT Strategy

In response to the question of whether the bank had a formally articulated business strategy, the MD responded:

“Interesting question. We do. I say it's interesting because on Thursday we are meeting to discuss our 5 year strategic plan which has been in the making for the last couple of years and I think an explanation of that is the transition of my coming into this banking environment and I think we are trying to do things a little differently. So yes, there is a strategy, it has been formulated, not formally adopted yet, but we all know what we want.”

The response suggests that while a formally articulated strategy has not been adopted, the bank's activities are being guided by relatively explicit objectives.

When asked about the formal articulation of the role of IT in the bank's strategy, the MD's response, while speaking with whole-hearted acceptance of the importance of the IT within the bank's competitive strategy, did not explicitly state that there was such articulation.

F.8.5 Content

F.8.5.1 IT Applications Available

The bank currently has IT applications covering its full range of activities. According to the MD, the “front office” was fully automated, as was the accounting. The bank provided Automatic Teller Machines (ATMs) at various locations throughout the island and these were integrated with its main banking system. It had a wide area network that provided a link to the branch offices, allowing customer accounts to be updated in real-time. It also had an intranet to support communications within the bank, although this had not yet been extended to the branches.

F.8.5.2 Extent of IT Use

Although the MD did not indicate how many of the bank's staff actually used computers for their day-to-day work, as indicated above, the extent of use of IT within

the bank is significant. IT is being used for delivery of customer service as well as supporting internal operations. Use has also been extended geographically to support the operations of the smaller branches and to link them directly to main system.

F.8.5.3 Benefits realized from IT

The MD seemed convinced of the benefits that had been derived from IT. Much of this was based on belief that the bank could not have remained competitive without the investment it had made in IT. His view of the benefits of IT can be illustrated by the following quote:

“So there is absolutely no doubt in my mind that it has made us more efficient and so on and so forth. It makes us able to talk to the rest of the world. We offer credit cards now. As a fourth-world country, we would not have even been able to conceive the idea without IT. We offer a credit card - a 4 Cs credit card which the indigenous banks in the region use, and it is Visa-based. Consider all of these things without IT. We would never have come out of the dark ages without IT. There’s no question about that.”

F.8.5.4 Experience with IT to Date

The bank had been generally satisfied with what it had derived from IT to date and the MD did not identify any of the negative experiences during the interview. The impression created was one of a positive disposition towards IT by management and staff as well as successful implementation of IT.

F.8.5.5 IT Successes

The general tone of the discussion was that the bank’s investment in IT had been successful. One of the specific successes mentioned was the fact that the use of IT enabled the bank to offer credit card services. The MD also seemed to consider the availability of real-time access at all locations via a wide area network and the introduction of an intranet to support internal communication and collaboration to be significant successes.

F.8.6 Summary

One of the most striking observations from this interview was the MD’s strong belief in IT as an enabler within the bank. While he did not offer many specifics about the internal structure and operations of the bank, he created the impression that the Internal Context was very favourable towards increased use of IT for competitive purposes. His enthusiasm and strong support for IT suggests that he is a major force in driving IT use within the bank. He also indicated that the rest of management and staff were as supportive of IT, attributing that in part to the relatively young age of the management and staff body.

The MD believes the bank’s environment is becoming increasingly competitive.

Although the non-Caribbean competition is a significant factor, he is of the view that Caribbean-based competition is the biggest threat. Non-traditional financial institutions such as credit unions, insurance companies and even government institutions also pose competitive threats.

Considerable importance has been attached to changing the public perception of the bank from its traditional role as a financial institution catering to the lower socio-economic classes within the society. IT appears to play a role in this changing perception, although it is not clear how much impact IT has had in that regard.

The IT function is managed by a technical specialist who also has significant experience in the banking environment. While the MD did not elaborate on the details of how IT is managed within the bank, he expressed confidence in the ability of the technical team to provide the required levels of service. He did not give any indication of the extent to which the technical team was involved in making or influencing high-level decisions about IT use.

IT is used to support the full range of operations, including “front office” (customer service) functions and back-end functions such as accounting. The bank has been able to link the operations of its various branches via a Wide Area Network and also deploy an intranet to support internal communications.

The MD was of the view that IT was critical to the bank's success, particularly in terms of improving the efficiency of operations and allowing it to remain competitive. He also believed that the bank's future survival depended on IT. In general, he expressed an overwhelmingly positive opinion about the role of IT within the bank and the level of actual contribution it had made. Even when asked about negative experiences, he did not offer any examples of areas in which he was dissatisfied. This could signify that the bank has been very successful in implementing and using IT under his leadership. It could also mean that given his strong belief in IT, he has chosen to play down the significance of any negative experiences to date.

F.9 Firm B – Interview with IT Manager

F.9.1 Background

This was one of two interviews conducted in Firm B. The background information is as given in section F.3.1 above.

F.9.2 Internal Context

F.9.2.1 Management Attitudes

The IT manager felt that the attitude of management towards IT use within the firm was generally positive. He offered the following explanation:

“I think they seem to realise what IT can do so it is not relegated to the back burner. I think what might probably push that too is that originally

most of the directors might have conceived what IT can do at this point in time when they bought it and what you can get out of it as far as information goes in the long term so I guess because of that, they had a change of heart.”

This positive disposition towards IT represented a change of attitude over time. He felt the positive attitude was most noticeable among the “younger directors” whose earlier training would have emphasized the importance of information for decision-making. Overall however, he believed that the management saw IT primarily as “the computer that produces billing or financial reports from stock” as opposed to something that produced information that could be analysed for making critical decision for the company.

F.9.2.2 IT Competencies

The firm had an in-house of IT staff of 2 persons (including the IT Manager) who provided day-to-day support. While the IT manager did not give any indication of how he considered the IT technical competencies to be a factor in determining the use of IT, he did express the view that the users’ competence was a factor. In particular, he believed that management were not taking advantage of the types of information available from the existing systems “because they were never trained that way”. He illustrated this by identifying the Marketing and Distribution Director as an exception – he described that Director as “very analytical” and one who could use the existing information to make decisions about marketing of new products.

F.9.2.3 Organizational Structure

The firm is headed by a Managing Director and managed by a number of executive Directors who were responsible for specific functional areas such as Marketing and Finance. The position of IT Manager reported to the Finance Director.

The discussions suggested that within this structure the influence of the IT Manager was limited. His response to a question about the availability of the IT budget illustrates how little influence he appears to have in the decision-making process:

“I am not sure what is the actual current amount . My boss, the Financial Director, when I take anything to him then I guess he analyses that within the framework of our budget. I don’t really have to work on that. I have never actually have to work on the budget.”

He was also not sure whether the firm had an IT strategy, admitting that while he did not believe that a one existed, it would be possible that one existed and was not known to him.

F.9.2.4 Sources of Competitive advantage

The nature of the firm’s business and the nature of its relationship with its suppliers were the main sources of competitive advantage identified by the IT Manager. He

believed that the fact that the firm was a wholesaler insulated it from some of the competitive pressures currently faced by retailers, particularly with regard to the North American retail firms that were currently entering the market. He also believed that having exclusive arrangements with suppliers for certain products provided protection against other firms wishing to sell the same products in that market.

F.9.2.5 Expectations from IT

The major expectation articulated for the firm's investment in IT was that users within the firm, particularly management and those involved in sales, would have better information available to monitor sales and make decisions based on that information.

F.9.2.6 Effect of Age of Staff

Age was considered to be a factor affecting use of IT within the firm. The IT manager believed that the "younger directors" were making more use of available IT resources and had been influential in getting IT more accepted among the senior management. In addressing the issue of changing attitudes, the IT manager also suggested that efforts to change attitudes would be more effective with the younger staff within the firm.

F.9.2.7 Non-management staff attitudes

The attitude of the non-management staff was seen as an inhibiting factor in the use of IT. The IT manager was of the view that the staff were not taking advantage of the capabilities offered by the IT system. He made this point with reference to the sales staff:

"I think quite a lot of the sales staff are not that proactive. They are more reactive when something goes wrong then they need to come back and do a check after the fact rather than thinking ahead like looking at the information there and how can I use this to market consumer products and stuff like that and also based on their experiences in the field."

He believed the attitude problems needed to be addressed through a process of education that would allow staff to develop a better appreciation of the processes handled by the systems, and their capabilities.

F.9.2.8 Source of IT impetus

IT was not clear from the discussion, which entities or individuals within the firm was most directly responsible for "driving" IT and it appeared from the IT manager's perspective, that IT was being driven from different sources. One statement seemed to suggest that the marketing function within the firm was most influential:

"... At least now things are driven by the marketing people and they are quite aware of what is happening in the global market as far as IT trends go and I think that at least some of them, like the marketing manager, are

very keen on trying to keep abreast of any developments. At least we don't have this lag there, we don't have people who are really not keen on IT. The management pushes to see what is done in the wider world and they are trying to get into that."

He also identified the Finance division as having "a very important say" in how IT was used, as they provided services to other departments. Notably however, the IT manager did not identify the IT department as having a key role in this regard. In discussing who should lead the effort to change attitudes towards IT, he stated that "IT can help in what they do and how they present some things" but he believed that the change should be "championed from higher up".

F.9.3 External Context

F.9.3.1 Sources of Competition

The firms faced significant competition from other local firms. The IT manager was not very specific about the characteristics of the competitors, but his comments suggested that some of the were firms similar to his.

"So it is a very competitive environment at this time. I guess it was more relaxed a couple of years ago but now its is a kind of dog eat dog situation out there. Some of the CEOs of the other companies make no bones about it. They are out to win if they can take away some of your business. I think before it used to be a kind of gentleman's agreement. People are not so civil at this point in time. If you have a good product and are doing good, every body will go after it to build up their portfolio, that sort of thing. So its not the easiest of markets at this point in time."

He also identified "small suitcase guys" – informal traders who operated on a smaller scale, as a potential threat as they imported some of the types of items imported by his firm. Presently they were not a major threat but could become more significant "if a lot of them did it".

The IT manager did not consider the foreign-based retailers who had recently entered the local market or who were showing such interest, to be significant threats. He believed that such firms were primarily a threat to retailers as opposed to distribution firms like his. He conceded however, that if such firms were able to take away market share from local retailers who were his firm's customers, his firm would in turn lose market share.

Overall however, the IT manager did not seem to have a clear understanding of who the firm's competitors were. In discussing the competitive environment, he also made reference to difficulties caused by customers defaulting on their payments, apparently considering different types of external threats as "competition".

F.9.3.2 Changes in Competition

The IT manager perceived the levels of competition from both Caribbean and non-Caribbean sources to have increased in recent times. Locally, traditional competitors had become more aggressive and less “civil”, as mentioned in the quote in the previous section. Also, the “small suitcase traders” posed a potentially bigger threat if their numbers continued to increase.

There was now a new threat from foreign-based retailers entering the local market. While the IT manager did not consider them a major threat to his firm, he conceded that they posed an indirect threat as they could erode the firm’s market by taking business away from the firm’s customers – retailers.

F.9.3.3 Technology Effects

The direct effects of technology on the competitive environment were considered by the IT manager to be minimal. He stated that he did not think that Internet-based selling had caught on in Barbados, and thus far, only one of the firm’s local competitors had attempted it. He also mentioned Internet-based selling being used by the hotels.

The IT manager also alluded to an indirect effect, in that availability of better information made possible by better IT had allowed competitors to become more aggressive.

F.9.4 Process

F.9.4.1 IT Development over time

The company ran its main inventory management and online billing application on a Unix-based multi-user system that it deployed in 1999. This was an “off-the-shelf” system but the system it replaced was a batch-oriented custom-developed application. According to the IT manager, at the time of the changeover, the computer being used to run the system was over 15 years old. He did not however offer an explanation as to the reasoning behind the changeover. While he indicated that this addressed the Year 2000 compliance issue for the firm, he did not suggest that this was the main reason.

F.9.4.2 How IT Managed

Internal IT services are provided by the IT Department consisting of the IT Manager and one other technical staff member. The role of this department appears confined to the provision of services.

The IT Manager reports to the Finance Director. The discussions suggested that while the IT manager made recommendations for acquiring IT resources to the Financial Director, the IT Manager himself had very little say on these matters and had no involvement in preparation of the budget. It does not appear that the firm engages in high-level IT planning and the IT manager, who was not sure whether or not the firm

had an IT strategy, was certainly not involved in any such planning.

F.9.4.3 Role of IT

The IT Manager articulated the role of IT within the firm primarily in terms of provision of better information. The availability of such information for decision-making was now critical for the prosperity of the firm, as he explained:

“Everybody is now more specific and wants a lot of historical information so that they can see the trends and see what has happened within their particular portfolio, so that they can see whether things are going good or bad so that they can make corrections or attempt to make things right before they get disastrously out of hand. Primarily, I think the use of information ... the systems ... that they use are trying to get as much out of it as possible. I think that it is not only <Firm B>, all of the more senior companies have tended to move that way. You can't really rely on salesmen to go out there and see how it looks, you need very objective decisions that can be based on actual hard facts based on the information you pick up.”

F.9.4.4 Business and IT Strategy

The IT Manager did not believe that the firm had a formally articulated business strategy, but admitted that “he may be wrong”, since he was not involved in activities at this level. Similarly, he did not believe there was an articulated an IT strategy. It was possible however, that “periodically throughout the year” the Finance Director would “make decisions about how things are going and what should be in place”.

F.9.4.5 Improving benefits from IT

In order to improve the benefits the firm derived from IT, the IT Manager believed that it should focus on two areas – training and changing of attitudes. Training was considered important because he believed that the one the main reasons the existing systems were underutilized was the users' unawareness of the capabilities or how to use them. This was particularly true of the sales force. According to him, “up to this point, they have never given us anything we can't supply for them”.

With regard to the changing of attitudes, he acknowledged this could be difficult to do and it depended on the users being convinced of the value of IT:

“The way people think would have to change. You really can't change people's perceptions unless you produce ... I guess you can probably soften or ease it a bit by producing something tangible that they can see how it can benefit their particular department or whatever the case may be.”

He also made the point that he expected the task of changing attitudes to become easier as younger staff joined the firm.

When asked specifically about where he believed the initiative for trying to change these attitudes should come from, he replied:

“I think IT can help in what they do and how they present some things, but I think it probably would be championed from higher up. Everyone is aware of the importance to the organisation and you could probably show how it is linked into all the various aspects of the business. I think it needs to be pushed from up top.”

F.9.5 Content

F.9.5.1 IT Applications Available

The main application identified by the IT Manager was a billing and inventory management system used to manage the core business of the company. This system was also capable of generating reports such as sales analyses, based on accumulated data.

The above is a purchased as opposed to customized application and runs on a Unix platform. The user interface is based on character terminals.

F.9.5.2 Extent of IT use

Of the firm's approximately 240-250 employees, the IT manager estimated that about 100 had access to the main application. While computers were being used by the “office” staff such as the management, sales and accounting staff, certain aspects of the firm's operations, particularly warehousing, were not computerized. Picking slips for items to be sold were prepared as part of the billing process and this was passed to the warehouse for manual picking of the goods.

The IT Manager did not give any indications of IT being used to support other aspects of the firm's operations.

F.9.5.3 Potential and unrealized benefits

In general, the IT Manager believed that the capability of the available IT resources to support the firm's marketing function were largely untapped. In particular, he indicated that as the main inventory and billing application was capable of capturing all movements of inventory, it represented a significant repository of information. This however, was under-utilized by the firm's sales staff, who he stated were “not proactive”.

The IT Manager also stated that there was more room for use of IT within the organization. He identified the use of software to support internal e-mail within the firm as an example of IT use that would “make life a lot easier”.

In general, he believed that IT was making “a pretty good contribution” to the firm, but not to the extent that it could, given the resources available.

F.9.5.4 IT Experience to date

One of the experiences that stood out in the IT Manager's recollection was that of moving from the previous application to the present one. It stood out because of the size of the undertaking as well as the issues that arose during the process. One of these had to do with the failure, for a period of 2 months, of the communications line between the firm's two main operating locations, because of work (unrelated to the firm's activities) being undertaken by utility companies. This occurred shortly after moving to an online system and as a result the firm was forced to have the same transactions entered at both locations to keep the data current.

The firm also experienced difficulties because of users' unfamiliarity with the concept of an online system, as discussed in the next section.

F.9.5.5 IT difficulties

In addition to the difficulties with the communications link referred to above, moving to an online system introduced difficulties in the way the firm's staff used the application. In the previous batch system, producing an invoice for delivery of goods did not directly affect a customer's account. The process of updating the customers' account was a manual one. Consequently, the staff had developed a practice of generating a new bill whenever another copy was required.

With the introduction of the online system, the activity of "generating a bill" automatically updated customers' accounts and inventory records. However, many staff maintained the previous behavior initially, leading to situations where customers' charges was duplicated. According the IT Manager, customers "reacted strongly" to the situation.

F.9.6 Summary

Viewed from the perspective of the IT Manager, the Internal Context is an inhibiting factor in the use of IT. While some of his statements about management attitudes are somewhat contradictory, the overall indication is that IT is considered important only from an operational perspective. Further, the organizational structure and management processes do not appear to give great prominence to the IT function. The IT Manager reports to the Financial Director and appears to have little influence in high-level IT planning activities, such as budgeting. It was notable that the IT Manager could not say definitively whether or not there was an IT budget.

The view that the IT Manager's influence is limited is further supported by his apparent limited awareness of the firm's external environment and the nature of its competition. While he was able to give general indications of the nature of the competition and changes in the competitive environment, he was not able to articulate this with any great degree of specificity.

The main role of IT identified during the interview was that of providing operational support for the sales, billing and inventory management functions within the firm. The IT Manager believed that the existing system had the capability to provide information to support better decision-making, but that this capability was under-utilized, largely because the potential users were not aware of the capabilities or how to take advantage of them. There seemed to be some ambivalence however, as to who should take the lead in bringing about the changes in attitude and knowledge that would allow the firm to take advantage of these capabilities.

The general impression derived from analysis of this interview is that within the firm, IT is still considered as primarily as a tool for providing basic operational support rather than as strategic resource. It appears that the IT manager is fulfilling a primarily technical function in making the IT resources available for use, and has little influence beyond this.

F.10 Firm C – Interview with Group IT Manager

F.10.1 Background

This was one of 2 interviews held in Firm C. The background information for the firm is as given in section F.4.1 above.

F.10.2 Internal Context

F.10.2.1 Resources

The IT Manager considered the availability of resources, particularly financing, to have a significant effect on the use of IT within the firm. This was particularly so because although the recommendations on IT acquisition and may come from the Head Office level, the cost of acquisition and use had to be borne by the individual business units.

The picture painted by the discussion was one of very high sensitivity to IT costs at the business unit level, to the extent that the units may decline to take advantage of what the IT Manager believed were potential benefits from IT investments, because of cost. The following quote provides a good illustration of how the IT Manager perceived issues of costs and availability of resources to be affecting decisions on IT use within the firm:

“What needs to be done ... I would like to see people first of all replace equipment before it gets broken and not wait until it is rusty before they decide to change it. Sitting here, that’s an easy thing to say. But when you have to fork out the cash ... your business has to fork out the cash ... to upgrade your server or your main system ... it’s not easy, especially if you’re not in a profit position. So I understand that it’s easy to sit here and say prevention is better than cure ... if your business and the computer goes down ... [a named subsidiary company] is one. They were not in a profit-making position for a while and you tell them change ... you need

to upgrade because if it breaks down you're in real trouble. But they couldn't afford it. So that's a circular argument ... and depending on the company ... I can't push to replace the server. Help spend more on technology ... even the basic technology ... a lot of managers can and should get laptop computers ... to go home and do their work ... that is free company time. But yet somehow, because it cost double of a desktop, they end up with a desktop."

This statement was made in response to a question about what things he believed the firm needed to do to derive greater competitive benefit from IT.

F.10.2.2 Management attitudes

The IT Manager spoke of both enabling and inhibiting attitudes among the management of the firm. In general, he considered the senior management at Head Office level to have positive attitudes towards IT. In reference to the senior management he stated:

"I think for the most part they are sold on IT and would like to find ... would like to use IT as a competitive advantage. But you know ... every company that ... there is no company ... when I'm running smoothly I have no problems and I don't want to change. Everybody has their problems ... and they come up every week, every month ... new different problems that you have to manage. That's why there's management. Putting in a new computer system or expanding into different kinds of technologies ... I would say that they would like to."

At the individual business unit level however, the IT Manager felt the attitudes were more inhibiting. As indicated earlier, management at this level were very sensitive to cost issues. They were also very cautious, requiring strong justification for proposed IT expenditure, in part because they needed to justify it to their individual Boards. For example, the IT Manager indicated that in discussions about possible establishment of an e-commerce site for the firm's travel agency business, the management typically asked questions such as "who else has done it", "how are they doing it" and "how much it will cost".

Apart from issues of costs, there were sometimes external constraints affecting the attitudes of management. One example was the case of a subsidiary that manufactured and distributed liquor products internationally. It had been suggested that this company could benefit from use of an e-commerce site to sell its products. The management were concerned however, that selling to international customers directly would affect its relationship with its distributors in various countries.

The IT Manager also felt that awareness and knowledge of IT played a part in affecting the attitudes. In particular, he believed that management of the business units did not avail themselves of opportunities to increase their understanding of the potential benefits of IT by attending seminars and similar activities on the business benefits of IT. Instead, they tended to send technical persons to attend such activities when they became available.

F.10.2.3 Organizational structure

The organizational structure played a significant role in decisions about IT and how IT is used within the firm. Perhaps the most significant feature of the structure in that regard was the decentralized nature, particularly with regard to decisions on IT expenditure. While management at the Head Office level was generally supportive of IT, management at the business unit level was more reticent and generally very concerned about the financial outlay.

The IT Manager also suggested that the management of the individual companies were more preoccupied with operational use of IT for purposes such as accounting, billing and inventory, as opposed to what he considered to be applications that would provide competitive advantage. He cited the use of e-commerce and use of hand-held devices by sales and delivery persons as examples of the latter.

Two other aspects of the organization structure that affected IT decisions and use were identified. Firstly, the existing structure and management practices were such that Head Office management did not attempt to dictate directions to business unit management but instead attempted to use persuasion and influence. Secondly, the level of ownership and control Firm C had in the subsidiary companies and consequently the influence of Head Office over their management, varied from company to company. The IT Manager summarized the situation as follows:

“In our environment ... I think none of the management up here at corporate head office really go to a general manager in one of the companies and say I would like you to ... They discuss it and hope that something would come out of it ... “yes, we should really give handhelds to van drivers let’s see how that works ...” and we don’t ... not do it. Secondly, a lot of our companies are joint ventures so both sides have to agree. Where we have full control we can nudge and nudge and we go ahead.”

F.10.2.4 Non-management staff attitudes

The attitude of the general staff body towards IT was not characterized as either positive or negative. The IT Manager did indicate however, that staff did not take full advantage of the IT resources available, using them only for basic purposes. While some persons occasionally experimented with more advance features of available applications, they were likely to give up once they encountered any difficulties.

The above was partly due to lack of understanding of capabilities of available systems. He cited an example of persons who would print reports from an application and then key the results into spreadsheets to perform analysis, rather than using the analytical capabilities of the source applications.

While the above suggested the need for more training, the IT Manager characterized the attitude towards IT training among the staff as negative. The firm offered an IT

training programme for general applications such as e-mail, word processing and spreadsheet use, but according to the IT Manager, while many users requested training, they did not participate in the training when it was offered.

F.10.2.5 Source of IT impetus

The impetus for new investment in and uses of IT came from various sources within the firm. The two main ones identified by the IT Manager were the IT Department and the management of the individual companies. He explained this with an example of a decision to provide laptops to delivery van drivers, which he considered to have been a success:

“Sometimes it comes from IT and sometimes it comes from the management. I don’t think it actually comes from one group of people more than from the other. If somebody sees an opportunity and they mention it ... we discuss it and if it’s worth it, we do it. For instance ... the van drivers having laptops ... that one came from management. I personally did not see it working ... I mean with potholed roads, van drivers keying like this ... I mean what happens when the paper jams ... what happens when the computer hangs? But it seems to be working great.”

He further explained that he did not believe any one individual was responsible for driving technology within the firm, and pointed out that driving technology within one company is different from driving technology within a group of companies. The IT Department tended to take the approach of “gentle nudging and suggesting” to persuade individual companies to consider possible opportunities for using IT, or took the opportunity to identify possible IT-based solutions when companies identified the need to address a problem.

F.10.3 External Context

F.10.3.1 Sources of Competition

The IT Manager did not offer a general summary of the sources of competition of the firm, pointing out that because of the diversified nature of its activities, it had different competitors in different sectors. He did acknowledge however, that in some sectors, particularly the food distribution and automobile sales businesses, non-Caribbean competition was a significant factor.

F.10.3.2 Changes in Competition

The IT Manager identified two changes in the nature of competition in recent years that he considered to be significant for his firm. One was the in automobile sales market where the sudden increase in the importation of used cars, which according to him, “took everybody by surprise and messed up all the authorized agents”. This had led to a significant drop in auto sales for his firm.

The second was the increase in direct importation in the food distribution business. Increasingly, customers were choosing to import their supplies directly, thereby bypassing distribution operations such as those run by his firm.

F.10.3.3 Availability of external support

Availability of external support for the firm's IT did not emerge as a significant factor during the discussions. It was however a matter of some interest to the IT Manager, as his firm made use of external resources from time to time for technical support and implementation. He appeared satisfied that the resources required were locally available.

F.10.3.4 Government policy and action

Government policy and action was identified as important factor in determining IT use in the case of e-commerce. The IT Manager believed that if firms like his were to make significant use of e-commerce for selling their products and services, legislation facilitating the use of credit cards for such transactions would need to be passed. The local banking sector would then need to follow suit by offering the appropriate services.

F.10.3.5 Other external constraints

The IT Manager identified the following as additional external constraints on the firm's use of IT:

- *Nature of relationship with distributors.* As indicated earlier, the firm manufactures certain types of products, some of which are exported. The alcoholic beverages in particular, have an international reputation and are distributed worldwide. The IT Manager believed that while this international market suggested a strong case for using e-commerce as a means of retailing these items, using this channel would create a situation where the firm would be competing with its distributors in various countries. This was a situation the firm did not want to create and was therefore reluctant to pursue this option.
- *High telecommunications costs.* The IT Manager believed that the potential use of IT to improve efficiency by supporting remote communication was constrained by the high cost of international communications links. He cited the particular example where the firm investigated the use of videoconferencing as an alternative to holding a management meeting involving persons based in Barbados and one based in the USA. The firm subsequently concluded however, that the telecommunications cost for a 3-hour videoconference was comparable to the cost of the airfare for the USA-based manager to travel to Barbados.

F.10.4 Process

F.10.4.1 How IT Managed

The way IT was managed within the firm to some extent reflected its structure. The IT Manager identified a total of 7 IT positions (including his), for which he was responsible. There were also additional IT staff in a few of the subsidiary companies. The IT Manager, (whose title is Group IT Manager) and his staff were assigned responsibility for various divisions of the firm. He explained the arrangements as follows:

“The Group is broken down for operating management purposes, not for financial reporting ... in four divisions: Manufacturing, Marketing, Financial and Services, and Catering. There is a Divisional General Manager for each of those divisions, ... that manages each of those companies within that division. I have ... well there is myself in charge of the Group IT ... and I have an IT Manager in charge of Marketing, IT Manager in charge of Manufacturing, an IT Manager in charge of Catering. I think they have something like IT Officer or some other title ... but in fact they are supposed to manage IT within their division. Financial is only one company, so I absorb that ... actually two companies one of them is [named subsidiary] and they have an IT Manager there. In the companies themselves, we have somebody that knows how to change paper and order ribbons and ... you know ... the consumables ... and change the tape to do backups. But if you have to add a user or connect somebody to the network or install applications ... that is where we come in, or we go and do that. So we have these IT managers ... then there’s me, and a person working for me, that kind of backs up these guys.”

The IT Manager did not indicate how much of a role the individual IT managers (referred to above) played in determining how IT was used in their areas or responsibility, beyond the support responsibilities implied above.

F.10.4.2 How IT deployed

No specific process for the deployment of IT throughout the firm was identified. The discussion suggested however, that the approach to deployment was dependent on the specific circumstances of each business unit. It also appeared that while the IT Department would take the lead in recommending improvements to servers and other parts of the “backbone” IT infrastructure within the units, improvements to access points and applications were made in response to demands from users. The IT Manager explained the situation as follows:

“I would always like to see more access but the number of access points is based on what the management ... I mean we don’t go and buy a PC and say “hey, I think we need to put a PC here for these 4 people. The management says they need a new PC ... the management says that PC is too slow for that person buy a new one. I don’t walk around budget time and say “well who needs a new PC? Do you need a new PC in place of ...” The Department head and the staff member ... they have to complain to their bosses ... “this PC is too slow ... it doesn’t have enough memory ... It takes me too long to do my posting “. They will complain, and

between the two of them, they will decide whether to budget to upgrade, or not ... Or, “the three of us and we only have 2 PCs, why can’t I get another one?” I don’t walk into somebody’s department and say “you’ve got 3 staff and only 2 PCs, please buy another PC.” It can’t work like that. I take care of the servers and the back-end and the communications throughout the company, so I will recommend “your server is 4 years old, but I really think you should budget to upgrade it”.

There was also very little centralization of IT resources. Apart from a group-wide e-mail system, there was very little sharing of applications across different companies and the IT Manager did not believe there was any significant benefit to be derived from maintaining full-time data links among the various business or between the individual companies and head office. He indicated that he had explored and subsequently rejected that idea. (The group-wide e-mail system functions on a “dial-up” basis).

F.10.4.3 IT Role

The IT Manager did not articulate a specific vision of the role of IT within the firm. He expressed the view however, that presently IT was playing primarily an operational support role, rather than a strategic role. He believed that there was an opportunity to play a more strategic role if the businesses in the group were willing to spend more on IT to achieve this.

F.10.4.4 Business and IT strategy

The IT Manager stated that the firm had a documented IT strategy, but that it was outdated. He did not offer any elaboration on how it was developed or used.

F.10.4.5 Improving benefits from IT

In order to bring about improvements in the level of contribution IT made to the firm, the IT Manager believed that the area needing most immediate attention was management training. Such training should focus on how IT can contribute to the business improvement. He also believed that the firm should undertake a more thorough budgeting process for IT, and that should include making provision for experimentation with new technologies that may be beneficial the firm. He expressed this view as follows:

“We have to have seminars, I think, that would ... not IT seminars ... business seminars on where we can use IT. Like the ones put on by the IBMs and ICLs ... we need to have our management attend more and realise a lot of companies all over the world are doing this ... it’s not something new and we are “guinea-pigging” it ... it’s been used and people have been doing it for years now ... why can’t we look at it. I think we need to somehow set aside an IT budget, not just 10% over last year ... or we need to budget IT stuff if we know something is going to happen ... we should have a little bit of a IT R & D budget ... I mean they have these “Palm Pilot” things now we should be able to just go an buy them and let

people play around with them and they would find ... you know it's hard for me to sit here ... if you get that you can do this, this and this ... and then we would have to find places that you could integrate it into your existing system and ... we should use handhelds or we should use these "palm pilot" things?"

F.10.4.6 Staff Training

Although the firm had a training programme in place to provide staff with basic skills for using common computer applications, the IT Manager expressed disappointment with the results to date. Despite the fact that training was arranged according to perceived user demand, response from the user population had been poor.

The training currently being offered only addressed operational use of applications. It did not address the broader topic of how to derive greater benefit from effective use of IT.

F.10.5 Content

F.10.5.1 IT Applications available

According to the IT Manager, every company in the group was "computerized". All units had access to the group-wide e-mail system and to the Internet in general, via dial-up links. Beyond that however, the applications available within each subsidiary company varied according to the type of business. By way of example, he stated that the bakery had a "baking application" and the automobile dealership had a "car application". Laptop computers are also being used by delivery vehicle drivers.

Reference was also made to typical operational business applications such as accounting, inventory management and billing systems, as well as the use of standard office productivity software for administrative tasks, throughout the group.

F.10.5.2 Benefits realized from IT

The IT Manager did not identify specific benefits derived from IT. However, in response to a question on this matter, he stated that the benefits derived have justified the expenditure thus far.

F.10.5.3 Potential or unrealized benefits

The firm, in the IT Manager's view, was not deriving the level of benefit it could from its IT resources. In particular, he believed that there was considerable value that could be derived from the information accumulated through normal day-to-day transaction processing.

"There are several companies I know that use their business applications to do the day's transactions, balance the day, make the bank deposits, then do it again and manage the inventory a bit. But actually do analysis ... as

time goes by, you build up this huge database of transactions and history that you could use to analyse and do projections. ... And the software these days, they have capabilities to do this analysis and do projections and then you tweak certain parameters and then you change interest rates ... depreciation or value or something and you do “what ifs”. But it’s not done enough I think.”

As mentioned earlier, he attributed much of this to a lack of awareness of the range of potential business benefits from IT, on the part of both users and management.

F.10.6 Summary

The organizational structure of the firm emerged from the discussion with the IT Manager as an overarching factor affecting IT use – and attitudes towards it in several ways. One of the most significant considerations was that despite the fact that there was a Group IT department, much of the decision-making on IT investments was at the individual company level. This appeared to constrain the influence of the Group IT Manager, making the structure an inhibiting factor in IT use.

The IT Manager considered the attitudes of management at the Head Office level towards IT to be generally positive, but those of management at the individual company level, where the decisions were made, were much less so. Further, it was not clear that any particular entity, either at the Head Office or company level, was the responsible for driving the IT agenda.

The diversified nature of the firm’s operations meant that it had different types of competitors, and the IT Manager did not offer a generalized summary of the nature of competition. He did allude however, to specific types of business – namely the automobile dealership and the food distribution business, where competition had become much more intense in recent years. In both cases, the increased competition was at least partly due to local customers purchasing directly from non-Caribbean suppliers instead of through his firm. He also identified some external constraints that inhibited the firm’s use of IT to improve its competitive position. This included the nature of the firm’s concern about competing with its international distributors if it used the Internet for export sales and the high telecommunications costs that negated some of the potential benefits of electronic collaboration methods.

While the IT Manager indicated that the firm had a documented IT Strategy, his statement that it was “outdated” and the lack of any reference to it suggested that he did not regard it a providing useful guidance in making and implementing IT decisions. Further, the discussion about the Group IT function alluded to technical support for the various business units but gave very little indication of a strategic role in directing the firm’s overall IT activities.

There appears to be a significant use of IT for typical operational purposes throughout the Group. The firm also uses a groupwide e-mail and collaboration systems. It appears that overall however, the IT Manager believed that the firm was not making as much use of its available IT resources to support or improve its competitive

position.

F.11 Firm D – Interview with CIO

F.11.1 Background

This was one of two interviews held in Firm D. The background information for the firm is as given in section F.5.1

F.11.2 Internal context

F.11.2.1 Management attitudes

The CIO described the head office management as “fairly enlightened” and “pretty IT literate”. They considered IT to be of strategic value to the firm and were supportive of the firm’s efforts to increase the use of IT. He attributed much of this to the CEO’s strong support of IT, and offered the following example to support this:

“In fact, our CEO even in a meeting up until yesterday when there was a question raised ... he was going to be out of the country for twelve days and someone said well what happens if X happens and he said “I run a virtual office, I am always contactable so don’t worry about that. You can contact me via email, you can contact me via my cell roaming etc.” That does help a lot when the CEO at the head office is living, possibly in comparison to some other CEOs, a fairly digital life.”

He added that because of the CEO’s personal appreciation of the value of technology tools, he saw the need to make significant investments in IT in specific business units to enable them to become more competitive.

F.11.2.2 Organizational Structure

The firm is comprised of a number of independent subsidiaries involved in different types of businesses. It’s structure as a conglomerate has had an impact on how IT is managed and used in the past and present. According to the CIO, the firm has swung between centralization and decentralization of IT over time. Currently, it was moving towards a hybrid of centralization and decentralization, with the position of CIO being created to provide overall supervision and strategic direction throughout the group. As a result of this, there was a dual reporting relationship for the IT function in businesses within the group – the IT function reported to the management of the specific unit as well as the CIO.

F.11.2.3 Sources of competitive advantage

The CIO identified the firm’s recent efforts to take greater advantage of IT as being a source of competitive advantage for it. Among the initiatives that he believed gave the firm an advantage over its local competitors was the creation of the position of CIO to

give IT “a presence at Head Office”. This had allowed the firm to pursue opportunities for strategic use of IT.

The firm had also invested heavily in IT for certain businesses, particularly for those in the “food group” – it’s food retail and distribution businesses. The CIO felt that this not only allowed it to survive and increasingly competitive market and prepared it to compete against non-Caribbean retailers who were now entering the market. As an indication of the competitive advantage he believe his firm derived from its IT investment, he pointed out that two of the local competitors in the food business were “on the verge of going out of business” because the market had become unfavourable.

F.11.2.4 Expectations from IT

The major expectation identified during the discussions was that IT would make the firm more efficient and productive, and consequently more competitive. The CIO placed particular emphasis on the expectation that the increased use of IT would put the firm in a better position to compete with the larger non-Caribbean firms entering the market. The following statement, which is part of the response to a question about the firm’s competitive strategies, illustrate this point:

“The second one is obviously finding ways to do what we do more efficiently. Cost of operation ... efficiencies ... being more productive in what we do. That is the challenge for competing globally really, the productivity challenge. How do we do what we do better at lower costs and faster? Technology. We are on the end of a cycle of investment within the food group where we have been replacing all of the major back end and front end systems to help us compete and restructure some of those businesses to allow them to compete more aggressively in advance of those competitors being here.”

This expectation appeared to be driven by the firm’s history and the nature of its business, which according to the CIO, has traditionally emphasized cost control. He explained this as follows:

“The other thing is that because the company is a trading company and its heritage and its genesis comes out of primarily as a trading company, one of the attributes of a trading company is that you focus on controlling costs and as a result that becomes a heavy focus, so in order to justify any investment one really has to do a sell to show how that will help you do the job at even lower costs, therefore helping you to improve your efficiency, to improve your productivity and improve your margins. There are going to be some units where if you can’t show that then you are not going to get the support for the investment if you can’t make that connection.”

F.11.3 External Context

F.11.3.1 Sources of competition

The firm's business activities are highly diversified and consequently the CIO was not able to identify a single "key competitor" or type of competitor. He indicated that there would be key competitors for each type of business. He did single out some areas for comment, however.

Within the "food group" the firm now faced competition from both the traditional local distributors and retailers as well as North American operations that were now entering the market. These North American firms were also competitors of the firm's hardware and "white goods" (home appliance) businesses.

In addition to competition from traditional automobile dealerships, the firm's automobile dealership business now faced competition from smaller local used-car importers as well as foreign used-car exporters who sold directly to local consumers. These non-traditional sources of competition for the auto dealership had become very significant in recent years, and according to the CIO, had led to his firm's auto business going through a "major restructuring exercise".

F.11.3.2 Changes in competition

Two significant changes in the nature of competition were identified with regard to the sources of competition mentioned above. Perhaps the most significant of this was in the automobile dealership business, where both the local and non-Caribbean had become more intense.

The CIO summarized the situation as follows:

"Our auto dealership has just gone through a significant restructuring exercise as a result of a major market shift. The introduction of the foreign used-car businesses and the change in consumer behaviour with consumers now going on the Internet or consumers going to very small entities who will bring in these foreign used cars. ... The ability now for someone within Barbados to start up a business of bringing in foreign used cars using email, using the Internet etc. to do their entire processing as opposed to being tied to the dealerships."

The second was entry into the local market of North American retailers who competed primarily with the firms' food retail and distribution business. The presence of non-Caribbean businesses in this sector of the local market represented a new threat.

F.11.3.3 Technology effects

IT was perceived to have had a major impact on the change in competition with regard to the automobile industry. As mentioned earlier, it was now possible for an individual or small business entity to import a used car into the country using the Internet. This had made it possible for a larger number of persons to bypass traditional dealers, thereby significantly changing the nature of that market. It also made it possible for foreign used car exporters in other countries to enter that market without

having to establish a local presence.

F.11.3.4 Consumer behaviour

As discussed above, changes in consumer behavior was identified as a factor affecting the firm's competitive environment, in the case of the auto dealership business. In particular, consumer's increased use of IT – in this case the Internet, as a medium for conducting business had enabled non-traditional and non-Caribbean competitors to compete directly with the firm.

F.11.3.5 Comparison of IT to competitors

The CIO believed that the level and nature of IT use was a factor in determining its competitive position vis-à-vis the foreign competitors. Specifically, he believed that the non-Caribbean firms entering the market were able to use IT more effectively to support their operations and decision making process, and that his firm needed to achieve this to be competitive. He explained this as follows:

“Integration, tighter integration among systems, reducing a lot of the human interaction and the number of times something is printed from a computer system to be keyed into another computer system to be keyed in again, that is one of the things that those global players have, they not only come with greater buying power but they also come with significantly integrated systems that allow them to electronically move information about and therefore make smarter decisions in terms of what products they should be carrying at what price etc. We also need to achieve that level in our systems as well.”

F.11.3.6 Sources of competitor's advantage

As explained above, the CIO believed that better use of IT to support operations and decision-making was one of the key advantages possessed by the firm's non-Caribbean competitor. He also believed that because of these firms' scale and scope of operations, they had greater buying power and lower operating costs.

F.11.3.7 Regional and International Context

Two international issues were identified as affecting the firm's competitive environment. One was the international trends towards “globalization” and “trade liberalization”, which the CIO believed explained the recent interest by international firms to enter the local market. These trends had reduced the traditional legal and regulatory protective barriers and had also given these firms an international outlook.

The second, which was a mitigating factor, was the terrorist attacks in the United States on September 11, 2001. The CIO believed that this event had “changed the world economy” and had slowed efforts by US firms to expand into foreign markets. While he did not think that this had “avoided the inevitable” in terms of such firms entering the local market, he believed the slowdown gave firms like his “a grace

period in which to re-tool and restructure to face the competition head-on”.

F.11.4 Process

F.11.4.1 IT Development over time

The IT function within the firm had gone from a centralized to a decentralized one over time, but eventually moved back to a hybrid of centralization and decentralization. The CIO explained that the reason for the current situation, which included the creation of the CIO position just over 1 year before the interview, was to support a more strategic approach to IT deployment and use within the Group. He summarized the history as follows:

“[Firm D] had gone through a traditional cycle that you would have seen in North America where there was a migration from centralisation to decentralisation out into the business units. Fifteen years ago, [Firm D] would have had your traditional central IT department where all subsidiaries basically depended on that IT department for services. That model was changed and the IT department was basically disbanded, each subsidiary then became responsible for its own IT needs. What has happened within recent times is a recognition by the management at head office for the need to have that presence back at head office from a strategy and policy point of view whilst still allowing each subsidiary to operate in a decentralised manner but under some broad policy guidelines and then where it makes sense at a group level to pursue a certain strategy then do that.”

This approach also allowed the firm to provide certain common services across individual business. One example cited was the provision of data communications facilities.

In the past, there had been no formal integration of IT strategy into the business strategy. The creation of the position of CIO was expected to address that by providing a focus for strategic use of IT throughout the group.

The CIO pointed out that one of the challenges of moving towards the present situation was that previously there was no consistency in how individual business units accounted for IT costs. As a result, it was now difficult to determine “what the true costs of doing certain things are”.

F.11.4.2 How IT managed

The management of the IT function across the group of companies reflected a combination of head office direction and oversight on one hand and business unit level implementation on the other. The CIO explained the management arrangements as follows:

“The IT units within each business unit have a day-to-day operational and tactical responsibility for reporting to the management within that business

unit and it may vary by business unit. In some cases they may report directly to the managing director in other cases they may report in a traditional manner to a financial controller or accountant. It will vary by business unit. From a policy and IT budgeting point of view, they would then report to my office as CIO. One of the things that I would be involved in would be in reviewing their Capex Budgets at the beginning of the year and their project plans. I would be in daily contact with different persons within those units as it relates to issues that they need assistance from the group level with as well as monitoring the progress of certain key projects and making sure that they going within the direction that they should.”

Thus according to the CIO, IT management within the individual businesses had “dual accountability” – they reported to the management of the individual business units as well as the CIO.

F.11.4.3 IT Role

The overall role of IT within the firm, as described by the CIO, was to enable the firm to become more competitive and to put it in a position to survive the increasingly competitive environment. This would be achieved by allowing the firm to become more efficient and reduce costs of operation as well as making better information available for decision-making.

Within the “food group”, IT also played a critical operation role, and the CIO pointed out that the firm’s supermarkets, unlike some other types of businesses in the firm, could not operate if their point-of-sale systems failed.

F.11.4.4 Competitive Responses

The CIO identified the following as competitive responses that the firm was pursuing or intended to pursue to address the current competitive environment:

Consolidation. The firm was consolidating a number of its business operations in the hope of deriving benefits from improved efficiencies and economies of scale.

Improvement in operations. The firm was placing emphasis on improving its productivity and efficiency and reducing its cost of operations. The CIO considered this particularly important, as the firm did not have the buying power of its non-Caribbean competitors that enable them to obtain their products at lower prices. In that regard, IT was seen as playing a key role in improving the firm’s competitiveness.

Offering new products and services. One of the responses of the automobile business to the erosion of the new car market by the importation of used cars was to begin importing and selling used cars themselves.

Partnering and collaboration. The firm had taken a decision to partner with one of the new foreign retailers entering the market, as an investor. This would allow it to derive some of the benefits of the business that the new firm was able to capture. Firm D had decided to partner with this new entrant despite the fact

that it competed with Firm D in some product lines

F.11.4.5 Business and IT strategy

The CIO did not state explicitly whether the firm had a formally documented business strategy, but explained that the practice was for the management of each company in the Group to present its strategy to its Board of Directors. These strategies were tailored to the particular business sector of each of the companies.

As far as the CIO was able to discern, there was not a practice of integrating IT strategy into business strategy at the individual company level. He pointed out that part of the reason for creating the position of CIO was to address that situation.

F.11.5 Content

F.11.5.1 IT Applications available

IT applications are used to support basic operations throughout businesses within the group, and according to the CIO, “there is not a single business unit where IT is not a key part of doing their job”. Much of the discussion about specific IT use within the firm focused on the “food group” businesses however. At the time of the interview, the firm was in the midst of implementing a new integrated retail and distribution system throughout businesses in the “food group”. It had also recently rolled out a “group broadband” wide area network (WAN) to support communication and collaboration among businesses in the group as well as external communications.

There was also an e-commerce application being used by the “food group” that allowed customers to order groceries online for home delivery. The CIO did not state how successful this was but indicated that several of the buyers were nationals resident overseas who purchased groceries for their relatives at home.

F.11.5.2 Extent of IT use

As mentioned earlier, the CIO indicated that IT played a key role in supporting all the firm’s businesses. He also estimated that 30 to 40 percent of the firm’s employees were “information workers” that used computers as part of their day-to-day work.

F.11.6 Summary

The CIO created the impression of a firm that had pursuing a deliberate strategy of strengthening its Internal Context to allow it to take greater advantage of IT to respond to perceived changes in the competitive environment. Senior management appeared highly supportive of IT, due in part to the influence of the CEO who had a strong personal appreciation of the value of technology.

The firm had clear expectations that IT would allow it to become more competitive, primarily by allowing it to become more efficient and productive, including

controlling costs and helping to speed up operations. The CIO believed that the firm had already derived competitive advantage from its investment in IT, alluding to its success so far in surviving while other local competitors were “on the verge of going out of business”.

One of the most significant observations in that regard is that the senior management seem to be very supportive, with the CEO championing the cause.

While the firm is a conglomerate with several independent businesses in different industries, it had been able to devise an IT management structure that was a hybrid of centralization and decentralization – it allowed the CIO at head office level to provide strategic direction and general oversight for IT throughout the firm, while allowing individual businesses to make their own IT decisions and manage their own IT resources on a day-to-day basis.

Since the firm is a conglomerate operating in different industries, the CIO did not consider it to have specific “key competitors”, but believed that it was particularly vulnerable to foreign competition in the “food group” businesses and the automobile sales business. In the former, competition was made more intense by the entry of North American retailers into the local market. In the latter the firm’s market share had been significantly eroded by the importation of used cars facilitated by IT use (in the form of the Internet), by foreign competitors, smaller local competitors and consumers. In the case of the non-Caribbean competitors, he believed that better use of IT as well as being able to obtain better economies of scale provided advantages for these firms.

The CIO identified four strategies that the firm was pursuing to address the current competitive environment. The current IT investment efforts seemed to be directed primarily at one component of this – improving operations by improving productivity and efficiency and reducing costs. To date the firm did not have a practice of formally integrating IT strategy into its business strategy, but the creation of the position of the CIO was expected to do that.

Most of the current IT activity within the firm appears to be decentralized, with all of the businesses making some use of IT. Much of the firm’s current investment seemed to focus on the “food group” businesses. However, it had also introduced a Wide Area Network to facilitate communication and collaboration among its various businesses