CRANFIELD UNIVERSITY

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THE ROLE OF COMMUNICATION IN

ENTERPRISE SYSTEM IMPLEMENTATION

SCHOOL OF INDUSTRIAL AND MANUFACTURING SCIENCE

PhD THESIS

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ABSTRACT

The research efforts up to date have not been directed towards the study of the role of communication during an implementation of an enterprise system. However, some efforts are noted which stress communication as a critical factor and a problem in general during the implementation. During the scoping phase of this research, communication was proved to be of significance as a process in the realisation of embedding of an enterprise system into the business. Considering the complexity of an implementation of a system and consequently the complexity of its study, the research method based on processual approach was developed to enable a better understanding of the dynamics of this process. Three case studies have been conducted with the focus on the understanding of the role and significance of communication. They included interviews with the employees involved in the project or affected by the new system: project managers, top managers, system specialists, and users. The findings focus on the elements important to realise the communication process: communication strategy, management activities such as announcements, motivation to communicate, resources such as time, how informed the people who are involved are, communication across the project, communication structure and process, facilitators as people who enable the communication process, and communication about the technical issues. Special focus was on the effect of communication on the transfer of psychological ownership of the system, concerns about change and employee commitment. Additionally, several themes are found to affect communication. These are: organisational structure, team cohesion and trust. The role of communication confirms that all the parties need to use the same language to enable common understanding. The communication process is found to have direct and indirect influence on development of common organisational goals, positive attitude towards the new system, and embedding of the new system in current organisational functioning.

PUBLICATIONS

Refereed conference papers:

1. Sedmak, M., Fan, I.S. and Wognum, P.M. (2004), 'Hidden gems: What literature reveals about the cases of enterprise system implementation', Proceedings of British Academy of Management Conference 2004, St Andrew's, UK.

2. Wognum, P.M., Mensink, G., Bühl, H., Ma, X., Sedmak-Wells, M. and Fan, I.S. (2004), 'Collaborative enterprise system implementation. Improving project start-up', Proceedings of Concurrent Engineering Conference 2004, Beijing, China.

3. Sedmak, M. (2005), 'Communication issues during enterprise system implementation' Proceedings of British Academy of Management Conference 2005, Oxford, UK.

4. Sedmak, M. (2005), 'Communication on ES implementation projects: A SWOT Analysis' Proceedings of the International Conference on Computers and Industrial Engineering, Istanbul, Turkey.

Publications for the EC project BEST – Better Enterprise SysTem Implementation, IST-2001-35385:

5. Sedmak-Wells, M. (2003), 'SOTA Change management from the research literature point of view', Doc. Ref. No.: BEST_WP2_W_20030525_V02_SOTA_Change_mgt_res, pp 1-33.

6. Sedmak-Wells, M. (2003), 'SOTA Change management from the research literature point of view – Bibliography', Doc. Ref. No.: BEST_WP2_W_20030902_V01_SOTA_bibliography, pp. 1-12.

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8. Wognum, N., Mensink, G., Warne, C., Bühl, H., Lombardo, S., Ma, X., Sedmak-Wells, M., Lisanti, B. and Kenett, R. (2004), 'Report 2.7: Case study analysis', Doc. Ref. No.: BEST_WP2_R2.7_20040119_V02, pp. 1-48.

9. Sedmak-Wells, M., Galasso, F., Fan, I.S., et al. (2004), 'Report 2.8: Literature analysis', Doc. Ref. No.: BEST_WP2_R2.8_20040214_V02, pp. 1-41.

10. Sedmak-Wells, M., Galasso, F., Fan, I.S., et al. (2004), 'Appendices for Report 2.8', Doc. Ref. No.: BEST_WP2_R2.8A_20040216_V02, pp. 1-77.

11. Sedmak-Wells, M., Fan, I.S., Farooq, I., Simms, M., Wognum, P.M., et al (2004), 'Deliverable 2.2: Enterprise system implementation organisation and human issues' Doc. Ref. No.: BEST_WP2_D2.2_20040302_V01, pp. 1-12.

12. Kenett, R., Hacohen, M., Fan, I.S. and Sedmak-Wells, M. (2004), 'Deliverable 2.4: Catalogue of generic ESI improvement tools', Doc. Ref. No.: BEST_WP2_D2.4_20030825_V02, pp. 1-174.

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14. Sedmak, M. (2004), 'BEST validation report using literature analysis', Doc. Ref. No.: BEST_WP4_R_20040722_V01, pp. 1-47.

GLOSSARY

BPR – Business process reengineering

CEAO – Cause, Event, Action, Outcome

CRM – Customer Relationship Management

CTO – Configure to order processes

ERP – Enterprise Resource Planning

ES – Enterprise system

ESI – Enterprise system implementation

FAT – Functional acceptance testing

IT – Information technology

NPD – New product development

SAP – A type of an enterprise system provided by the SAP company

SMART objectives – Specific, Measurable, Achievable, Relevant, Time bound objectives

SME – Small and medium enterprises

SPC – Strategic Profit Centre

SOTA – State of the art

SWOT – Strengths, Weaknesses, Opportunities, Threats

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1   INTRODUCTION

This study addresses the communication issues arising during implementation of an enterprise system. Chapter 1 introduces the context of the problem and origins of the research questions, the research process, the output of the research, and the layout of the thesis.

1.1   The reality of enterprise system implementation

Information technology [IT] is defined by Beynon-Davies (2002) as *"any technology used to support information gathering, processing, distribution and use"* (p.5). IT has become an essential aspect of most businesses and many organisations cannot function without it. The introduction of a new wholly or partly organisation-wide IT system is a major undertaking that usually requires major organisational change. An enterprise system, as a specific type of IT system, has been of great interest. The enterprise resource planning [ERP] system, as one of the ways to integrate an enterprise, can be defined as an integrated, customised, packaged software-based system that handles the majority of the enterprise's system requirements, within the areas of finance, human resources, manufacturing, sales and marketing, using software architecture such that it facilitates the flow of information between the functional areas of the enterprise (Kumar, Maheshwari, and Kumar, 2002). Considering that organisations might spend millions implementing these systems and risk losing millions if it is not done well, this area of research continues to be of great interest. Over the last decade enterprise systems have become more wide spread. During this time a substantial amount of literature has been published on different enterprise systems, their implementation processes, adoption and use, and the potential benefits to business performance. Some of this literature is reviewed in Chapter 2.

There are many examples of implementations that have gone wrong, as the project takes a long time to complete and requires numerous resources (Section 2.1.7). These range from problems with processing financial aid for students and recording grades, leading to regular queues of 200 students (Stedman, 1999b); a 19% drop in profits in one quarter and 29% increase in inventories over one year and missing or erroneous paycheques for employees; to a $3.5 million operating loss in one quarter due to the costs and inefficiencies of the IT system (Motwani, Mirchandani, Madan, and Gunasekaran, 2001). In a report by OASIG (1996), a DTI-supported Special Interest Group, it transpired, among other findings, that:

- the performance objectives of 80-90% of IT investments are not met,

- the frequent lack of influence by the end users on system development has an adverse effect on subsequent performance,

- there is a lack of understanding of the links between technical and organisational issues among the senior management, who see their staff as production units and *"sources of error and unpredictability"*,

- the importance of organising work and designing jobs to make new technology effective is significantly under-estimated, and

- an approach which integrates organisational and technical change is missing in most organisations.

According to a number of more recent articles and papers (Stedman, 1999a; Dryden, 1998; Holland and Skarke, 2001; Wheatley, 2000; Songini, 2002), problems of this nature have not been resolved.

1.2   The lack of support for practitioners

On the other hand, the author has had personal experience with implementation of an organisation-wide IT system in the manufacturing industry. While leading the project of data preparation for the introduction of the system, many problems were encountered regarding the 'people' side of the tasks, which made the realisation of the project difficult. This resulted in the author's keen interest, primarily from the practical perspective, in change management; how to manage people without any hierarchical authority at the time of implementation, and how to secure greater commitment, even if the consequence might be eventual job loss. However, the literature aimed at practitioners and available at the time was insufficiently detailed in these areas to be useful.

Further study of the academic literature showed that some work on evaluation of IT systems has explained in greater depth the notions of success and failure of an implementation (e.g. Lyytinen and Hirschheim, 1987), while other authors argue that the judgement of the level of success of an IT system is based on the 'gut feeling', (e.g. Hillam and Edwards, 2001). In addition, although the study of factors affecting the implementation was present, it could not explain to a satisfactory level the reasons for the success or failure of implementation as seen in practice. The literature did not provide the mechanism for understanding the processes occurring in the context which could be put in place to facilitate the implementation from the practitioner's perspective.

Initially, the case study and qualitative data in the context were chosen as a means of deepening understanding of the processes occurring during the implementation. As the understanding of the overall processes increased, it transpired that apart from studying the processes, it was important to gauge what effect the processes had on the people involved in or affected by the project. At this stage it became clear that an interpretive perspective needed to be taken. Additionally, it became evident that communication as a process is not seen as satisfactory by the people involved in the study. The literature supported the fact that communication during the implementation project is one of the factors affecting the success. However, there were no studies to enable a better understanding of communication process that would be useful to a practitioner, nor were there any providing comprehensive guidance towards ensuring successful and satisfactory communication.

1.3   The aim of the study

For the reasons stated above, it is clear that in the implementation of enterprise systems, the methods and the preconceptions about the 'best' way to implement these systems need reconsideration. This research focuses on the processes related to implementation of enterprise systems in companies. Based on earlier studies enterprise

system implementation it was concluded that certain areas, and communication during IT system implementation in particular, have been under-studied (Chapter 2).

Initially, the aim of the research was to investigate the processes that occur during the implementation of enterprise systems; to establish the sequence of events, and thus the best formal and informal practices in place to overcome implementation problems. The framework of processes occurring during implementation gives a broad and overall picture of the specific issues involved during implementation (Sections 4.1.1.5 and 4.1.2.2).

The objectives of this early stage of the research were as follows:

I. To carry out a review of the earlier research on the factors or processes that influence the implementation of enterprise systems, in order to identify the extent of and gaps in current knowledge in this field,

II. To develop a comprehensive picture of the processes affecting the implementation of the system, and

III. To investigate which of the processes during IT system implementation play a significant role in that implementation.

The research questions help in defining the scope of future work by selecting specific issues related to specific actors in specific contexts (Miles and Huberman, 1994).

The research questions for the scoping phase were as follows:

1. What human related, organisation related and technical related processes occur during the implementation of an enterprise information system?

2. Which of the processes play a significant role in IT system implementation?

1.3.1 The importance of communication

The research activities conducted in the scoping phase, the case study, the literature content analysis, and the literature review provided evidence that communication during enterprise system implementation is an area where there has been little study. This is demonstrated in the case study findings (Section 5.2.4.1). Communication from the top and middle management to the operational level which comprised users to be, and within the project team, was found to be problematic. In addition to this, there are significant gaps in the literature on enterprise systems implementation regarding communication. This transpired from both the literature content analysis, where communication issues did not feature (Section 5.3), while communication was stated by many authors as one of the critical factors, but again not explored in depth (Section 2.1.4).

The objectives of the research following the scoping phase were to:

IV. Identify which communication occurrences are seen to significantly affect the implementation process. The communication occurrences were to be selected by the employees as the events, states or processes of information exchange that significantly affect them or the implementation process, either in a positive or negative way, during the implementation of the system.

V. Identify to what extent the communication occurrences are perceived by the employees to affect the transfer of ownership of the system, anxiety about the change, and employee commitment.

VI. In parallel, develop the data collection method in a way that the previous two objectives can be achieved.

The research questions for this phase were as follows:

3. How does communication within the project team and between the project management, top management and end users affect the process and people involved in an enterprise system implementation?

4. How does this communication affect the process and people involved in terms of employee commitment, concerns about change and transfer of psychological ownership from the top management to the end users?

5. In what ways can we study the implementation process to improve our understanding of the discrete communication processes occurring during the organisational preparation for go-live?

Figure 1.1 presents the objectives in relation to research activities and outcomes (Section 1.5). Research activities can be classed as: literature activities, including literature review and literature analysis; case activities, involving case study and case data analysis; expert involvement, with the purpose to validate the findings, and to validate the research technique, such as data analysis and interview structure; and research development activities, relating to the development of the interview structure. Objective I was fulfilled by performing literature review. Objective II involved case activities, literature analysis and expert involvement. Case activities and literature analysis contributed towards fulfilling objective III. Objectives IV and V were achieved by conducting further literature review, case activities and involving the experts. Finally, objective VI was completed by the activities relating to the further literature analysis to support the data gathering tools, research technique development and further involvement of the experts.

The beneficiaries of this research are the top management, implementation project management, key users and end users. This research is aimed at bridging the gap that exists between the groups of participants with regard to communication in an organisational setting.

Objectives

Objective I

Objective II

Objective III

Objective IV and V

Objective VI

Literature activities

Case activities

Literature activities

Expert involvement

Case activities

Literature activities

Literature activities

Case activities

Expert involvement

Literature activities

Research technique development activities

Expert involvement

Literature review

Scoping case studies

Case data analysis

Lit. analysis

Expert 1

Expert 2

Scoping case studies

Case data analysis

Lit. analysis

Literature review

Drillco case study

Case data analysis

Expert 3

Literature review

Interview structure development

Expert 3

Healthco case study

Case data analysis

Expert 4

Identified gaps in literature

Developed a picture of processes that affect implementation

Identified communication as a process playing significant role

Identified communication occurrences that affect implementation, and in relation to ownership, anxiety and commitment

Developed the method to identify communication occurrences

Figure 1.1: Research activities related to objectives and outcomes

1.4   The scope of the study

The research focuses on companies within the private sector which provide and deal with manufactured goods. This is deemed important as the enterprise system which is implemented in companies within the manufacturing sector, even if they outsource the manufacturing of the goods, influences the extent of the system to be implemented. Four case studies were conducted, of which three were completed. The full studies involved Durco, Drillco and Healthco[1], where the study in Drillco was additionally used to refine the data collection method. Changes in company ownership prevented further data collection in Furco.

In terms of the company size, two large companies with over 250 employees were selected to be the focus of the study, one in the scoping of the processes – Durco, and the other one with the focus on communication - Healthco. The case study in Drillco, a company which falls in the category of SME with fewer than 250 employees, was selected to additionally refine the data collection method before studying implementation in Healthco. Comparisons could be drawn between different company sizes in terms of the effective communication methods used to get the company employees on board. These are discussed in Chapter 6.

The unit of analysis chosen is that of the implementation of a system within one company and on one site. In the case of the last company studied, Healthco, the implementation involved several releases of the system which were planned in company offices abroad. These were not taken into account in comparisons between companies as only in one case was the implementation of that scale. However, the findings are presented in order to give a richer picture of the complexities and intricacies involved in enterprise system implementation, and to provide a more thorough answer to research question 4.

Regarding the level of analysis, at micro-level, individual employees would have been studied, and psychology as a discipline would have been appropriate to apply to the study of the personalities involved in the implementation. At macro-level, the organisation as a body would have been studied, for example its culture, and in this case sociology as a discipline would have been appropriate. However, what is missing from the literature on enterprise system implementation is the meso-level analysis of processes occurring between individuals, and the perceptions of these processes. For this purpose, research tools needed to be developed in order to learn about these phenomena.

The timing of the data collection was important to this research. Of particular interest was the period before the go-live of the system, as this is the time when the companies were expected to involve the end users in the system development process, as well as to communicate with all the end users with regard to the new system. This is covered in more detail in Section 2.1.7. In Drillco, this period was covered retrospectively, shortly after the system went live. In the two other full case studies, the data was collected prior to go-live. Figure 1.2 shows access time to the cases relative to go-live date.

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[1] Company names were changed for the purposes of disguising their identity.
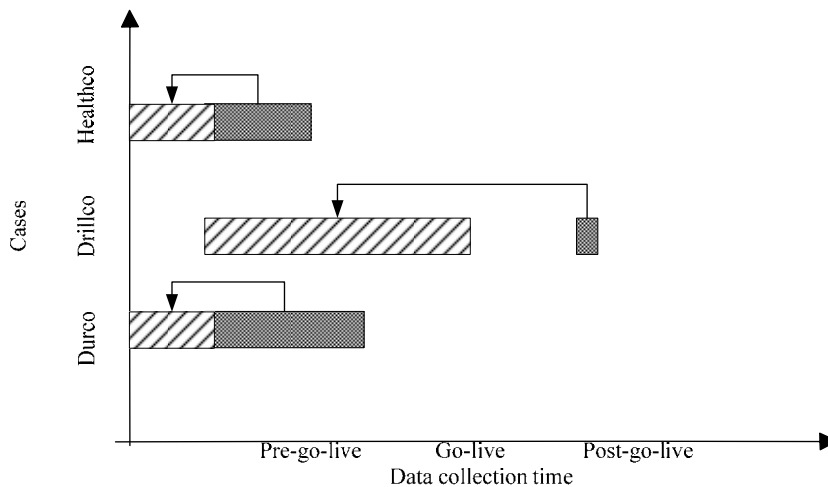
Figure 1.2: Access to cases relative to go-live

The timing of access to cases:

- Durco, case study 1 – one month before going live.

- Drillco, case study 2 – one month after going live, data collected retrospectively about the time before going live.

- Healthco, case study 3 - three months before going live.

The reasoning behind the choice of the timing for conducting a case study is closely linked to the objectives of this research. This research project is looking specifically at the communication between the parties involved in the project and employees as users, and in Section 2.1.7 these users become key players after the go-live of the system. However, communication about the project, and the key players' awareness of the new system and training start much earlier. This was recognised in the case of Durco and then exploited in further cases. The aim of the research is to study specifically communication before the project goes live, and how the initial communication steps facilitate the process of the users getting on board.

1.5   The research process

The perspective taken in this research is interpretative (Section 3.1). In interpretive research, it is not important to verify that what was perceived to have been done was actually done. However, it is important to understand how what was done was perceived by the people involved in or affected by the implementation of the system. In order to achieve that, the research was based mainly on qualitative data coming from the case studies and literature. In addition, data is presented in the form of frequencies of occurrences. Case studies involved interviews, focus groups and workshops, and company literature, project documents and website as supporting literature in addition to the primary data. Literature data was collected from reports on case studies and prescriptive literature with less extensive case data. Additionally, quantitative analysis was performed in terms of the number of occurrences of particular types of event in the category of events.

It is important to note that the terminology selected throughout the study evolved in its own right as more understanding was gained about the area. Initially the segments of the process that were investigated were termed 'causes', 'events', 'actions' and 'outcomes' [c-e-a-o]. This terminology is linked to the positivist tradition, although in case of this research the focus is on perceptions, rather than externally observable facts. However, during the research process, it became apparent that the term event does not cover a state. Following on from this, the interviewees were asked about the events or states. This again appeared to be research jargon, and it did not cover the processes. Consequently, in the next phase the terms 'communication success' and 'barrier' were used. This helped in uncovering either the significant events or processes, or even facilitators of the communication process, and thus exposed what the interviewees perceived to be successful or a barrier to communication during the project.

Additionally, conscious effort was made during the interviews to elicit as much as possible the hidden meanings that the interviewee would not make explicit, but which could easily be assumed by the researcher, possibly incorrectly. This is covered in some depth from the research methodology perspective in Section 3.8. Attention was also paid to understanding the inner world of each of the interviewees through the language they were using, which was very different from person to person, and from company to company. It was noticeable that interviewees' language varied according to the type of job they were doing and the company they came from, be it the company implementing the system or the consultancy involved in the implementation.

In terms of strategy, this research starts from a standpoint where a particular theory or hypothesis already exists about the phenomenon of enterprise system implementation failure, and then attempts to explore the reasons and causes for this phenomenon. The initial implicit hypothesis in this case is that enterprise system implementation fails in part due to inadequacy of communication process during implementation. However, the author sets out to initially explore the processes involved during implementation and find evidence to demonstrate that communication has an effect, but with an open mind, in that other issues might be found to be more relevant. Following on from there, there was a constant cycle of inductive and deductive research as the new data was collected and the understanding of the communication processes was refined.

The research process included four sets of research activities. They were:

- case activities related to the case studies – the data collection and data analysis,

- activities related to research technique development, with the focus on development of the interview structure; interview structure was based on the previous data collection and analysis, further objectives and research questions, and expert and interviewee comments, and supported by literature,

- literature activities related to the analysis of literature as secondary data in terms of data collection and analysis, and with the aim of maximising the use of the existing literature on the implementation of enterprise systems, and

- expert involvement in order to support the validation as well as the technique development, such as data analysis frameworks and interview structure development.

Figure 1.3 presents the research activities conducted over time. The relationship of the activities to the research objectives stated in Section 1.3 is also shown. During the scoping phase, the case study activities relate to fulfilling objectives II and III. Case data analysis relates to fulfilling objective II. Literature activities relate to objectives II and III. Expert opinion helped in confirming that objective II was fulfilled. When the focus narrowed down to communication issues, the case studies and data analysis were performed towards fulfilling objectives IV and V. The interview structure development was intended to fulfilling objective VI. Expert involvement here was related to fulfilling objective VI in line with the interview structure. Further expert involvement was intended to confirm that objectives IV and V were fulfilled.

1.6   The research output

The output of the research is primarily focused on answering the research questions and highlighting other areas which might benefit from further research. Any further findings and observations have also been reported in Chapters 5 and 6, and then discussed in Chapter 7. The contribution to knowledge is addressed in Chapter 8.

1.7   Thesis layout

The structure of the thesis is as follows:

Chapter 1.   The introduction presents the research problem in context and then covers the aim, research objectives and questions, and the scope of the study, the research process and the activities as they were performed chronologically, and concludes with the research output.

Chapter 2.   The literature review focuses on the current state of the art in implementation of enterprise systems. The benefits and drawbacks of variance and process theory are addressed in the context of the implementation, including the issues of project timing and sequence of project phase execution. Other relevant research areas are addressed in support of the limited body of literature on enterprise systems, which in fact form a part of the system implementation. These include reengineering, change management, communication, loyalty and commitment, and anxiety and concerns about change[2], including resistance to change, and psychological ownership.

Chapter 3.   The research methodology chapter presents different research perspectives within the IT systems field of study. Then the focus moves on to explain the different types of data that can be obtained, fixed and flexible research design, the role of the researcher in data collection and in the setting, the research method and strategy, and techniques for data collection. Research choices made in this research are also presented. The chapter concludes with research validation issues and criteria for contribution to knowledge.

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[2] Choice of terminology is presented in Section 7.2.1.3.
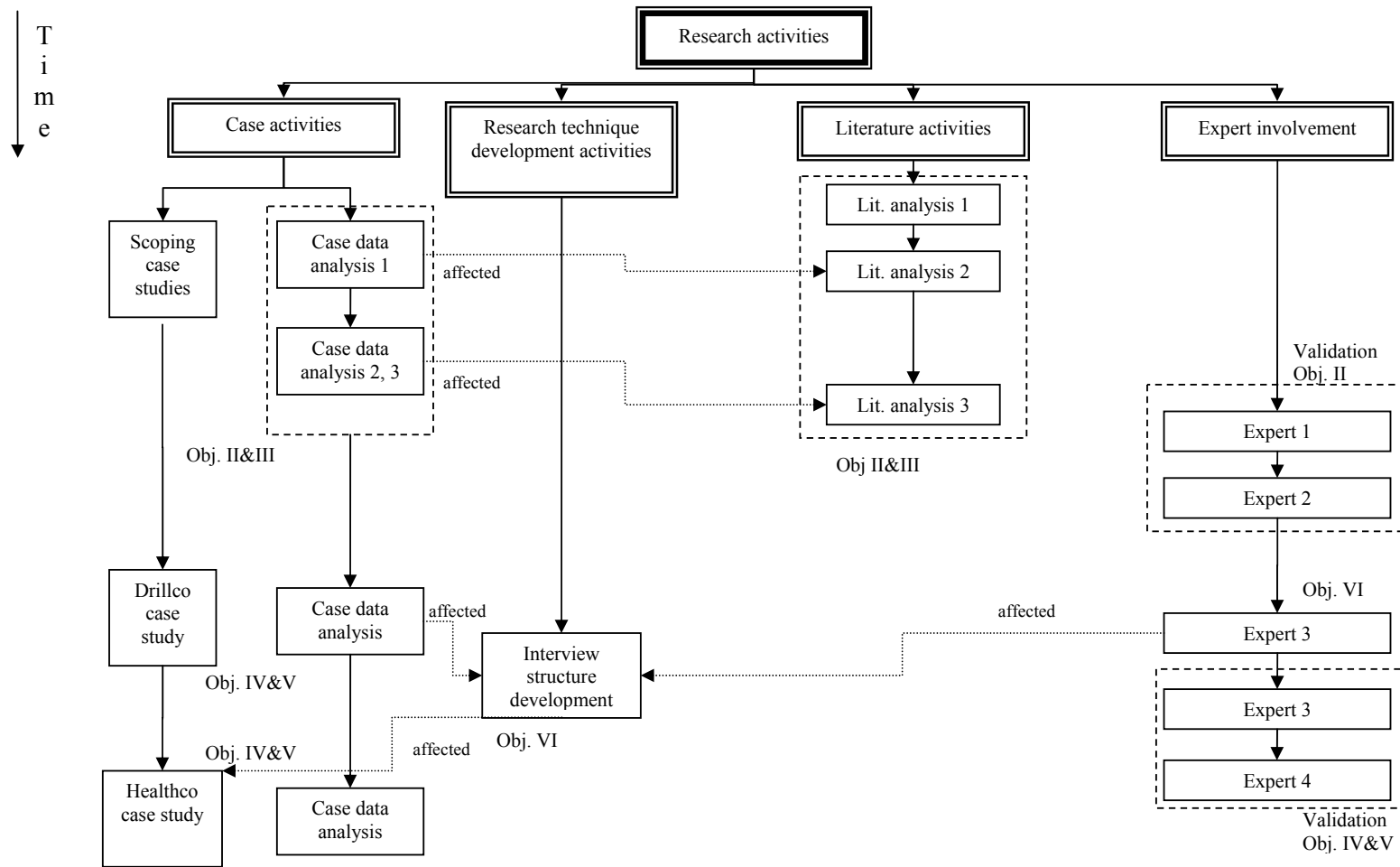
Figure 1.3: Research activities over time

Chapter 4. This chapter addresses the evolution of the data collection and analysis method from the scoping phase to the final case study.

Chapter 5. The chapter on scoping of processes during enterprise system implementation initially focuses on the case studies in Furco and Durco and presents the findings. The analysis of literature on case studies is also covered here, with the concluding sections addressing the validity of the findings.

Chapter 6. The chapter on communication issues during enterprise system implementation projects presents the findings from Drillco and Healthco. Further validation efforts are then addressed.

Chapter 7. Discussion addresses the findings in the light of the research objectives and questions, and links them to the main points from the literature, which was covered in Chapter 2. The discussion is related to the research methods used and the findings themselves.

Chapter 8. The conclusion chapter draws out the main points from Chapter 7, addresses the limitations of the research, and recommends further areas of research.

2 LITERATURE REVIEW

This chapter presents research related to enterprise systems and their implementation. The purpose of the chapter is to present current knowledge in the field, identify the gaps in literature and the perspectives available to answer the research questions. Research from other disciplines which supports the transdisciplinary approach towards understanding of the implementation process is included, in the light of the research questions stated in Section 1.3.

2.1 Literature review on enterprise system implementation

The purpose of this section is to review the body of literature on enterprise systems and their implementation. Following an introduction on what enterprise systems are, the focus shifts to the theories of behaviour in organisations, specifically related to implementation of enterprise systems. The basics of variance and process theories are presented, including the way time and sequence are seen, and then applied to the literature on enterprise system implementation. The section concludes with the focus on relevance of the process approach to enterprise system implementation.

2.1.1 Enterprise systems and their implementation

Enterprise integration occurs when there is an improvement of task-level interactions between the people, departments, services and companies, by the development of solutions and computer-based tools to facilitate it (Vernadat, 1996). The enterprise resource planning [ERP] system, as one of the ways to integrate an enterprise, can be defined as an integrated, customised, packaged software-based system that handles the majority of the enterprise's system requirements, within the areas of finance, human resources, manufacturing, sales and marketing, using software architecture such that it facilitates the flow of information between the functional areas of the enterprise (Kumar et al, 2002). These systems usually use one database, in which data is collected and stored in real time (Abdinnour-Helm, Lengnick-Hall, and Lengnick-Hall, 2003; Davenport, 1998).

Davenport (2000; 1998) argues that the name these systems are given should not be ERP systems, as this name stems historically from the MRPI - Material Requirements Planning, and MRPII - Manufacturing Resources Planning systems, which are based in manufacturing. He believes an ERP system is much more, and hence calls it simply an enterprise system. For this reason, ERP systems here will be referred to as enterprise systems [ES].

Objectives of new technology implementation might range from financial and economic, such as increased profitability, meeting competition, saving on costs and a way of dealing with labour shortage; via technical and production objectives, such as improving the processing, storage, transmission and information analysis, increasing flexibility, improving control, consistency and the product; to social and organisational, such as increasing control and skill (Preece, 1989). Vernadat (1996) states the main motivators for enterprise integration to be real information sharing rather than data exchange, interoperability, i.e. homogenising the operation of different systems, and improving task coordination between the people, units and systems in an enterprise. For the ES implementation, the perceived benefits are integrated real time information, better administration and result-based management (Kumar et al, 2002).

The impact of an introduction of new technology can be seen as greater than that of any previous mechanisation or automation process, as the relationship between new technical systems and people is much more complex and more important nowadays, while the interaction between the technical system and people is direct and immediate (Walton, 1985). New technologies can affect more employees in different ways and can influence work and communication patterns at higher managerial levels than before. While it is perceived that there are many performance benefits in introducing systems of this kind, the effective integration is problematic to achieve due to numerous technical and organisational problems (Kumar et al, 2002).

2.1.2   Seeing in black or white: Variance vs. process theory

Many researchers have complained about the state of affairs in organisational and social sciences due to the under-representation of dynamic or process approaches in the field of organisation change and information systems, e.g. Monge (1990) and Markus and Robey (1988).

Mohr (1982) has addressed the issue of developing and testing theories in organisational behaviour. He presents a dichotomy of variance and process theory depending on the approach that a researcher takes to build a theory in their work. Markus and Robey (1988), in their seminal paper on causal structure in theory and research, examine theories in terms of the authors' assumptions about the nature and direction of causality, based on the theoretical models in information technology and organisation change literature. Of particular interest is one dimension of causal structure, logical structure. Logical structure involves the *"logical formulation of the theoretical argument"* (p.589). The variance and process theories are given as examples of two different logical structures.

Variance theory assumes that a particular cause is a necessary and sufficient condition for a particular outcome to occur (Markus and Robey, 1988; Mohr, 1982). The assumption in variance theory is that an outcome will occur if all the conditions which are necessary and sufficient are present. However, process theory assumes that a cause is a necessary, but not sufficient condition for an outcome to occur, so an outcome might not occur even when conditions are present. There is no particular combination of conditions and causes which ensures the occurrence of an outcome (Mohr, 1982). However, particular outcomes still happen. Then particular outcomes occur by chance, i.e. governed by the laws of chance. The process theory according to Mohr (1982) deals not only with probabilistic processes, but also with the external forces which influence the system, such as organisation and people, and their causes, to move the system in a particular direction and towards a particular outcome.

Monge (1990) has also addressed the process theory, but in a different way from the approach discussed above. His focus is on the causality of occurring events, and the relationships of influence between two or more variables over time. Although Monge's approach is in essence processual, it is heavily based on the technical sciences and systems approach, where the influence of events is mechanistic and measurable[3]. His approach to cause and effect dynamics can be associated with closed systems where

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[3] Course notes in Automatic Control, Faculty of Mechanical Engineering, University of Belgrade, winter term 1993-1994.

there are no external and unaccounted for influences. As such, it is unrealistic and not useful in the context of a complex social system.

Shaw and Jarvenpaa (1997) criticise the approach of the theorists, particularly Mohr (1982), who recommends using either variance or process theory in IT systems research. They developed a framework with several classes of what they call 'hybrid models', which lie between the pure variance and pure process models. The type of a hybrid model depends on the nature of the concepts forming the research model, such as variables or events/states, their occurrence, e.g. non-temporal, temporal or sequential, and their predictability - predictable or not predictable. The literature they used to populate the framework fell into four distinctive categories of hybrid models.

One of the problems with the use of the process approach is the 'methodological determinism' which indicates that the methods available to researchers determine and limit how the researchers approach the problem and pose research questions (Monge, 1990). Another possible reason for the stigma on phase models in process research can be traced to the fact that they lack the transparency of the mechanism which enables the occurrence of the phases that follow (Mohr, cited in Markus and Robey, 1988, p.592). The following sections describe the issues of time and sequence in enterprise system implementation.

2.1.3   Temporality and sequence

The way in which research is conducted over time differs in variance theory and in process theory. When researchers use variance theory, the research is of a cross-sectional nature. However, in process theory, there is a focus on the dynamic processes and this results in research being either longitudinal or retrospective (Sabherwal and Robey, 1995; Monge, 1990). Shaw and Jarvenpaa (1997) recognise three different types of relationships between the variables and events or states: non-temporal, sequential and temporal. In the case of non-temporal relationships, the variables are present at the same time. In process theory, the events are either related sequentially, one following the other, or else one event can for example be studied at two different points in time, temporally. Sabherwal and Robey (1993) compare the approach of the variance theory studying variables necessary for project success to knowing what ingredients form a dish, but cooking it without a recipe.

The evidence for predominance of the 'one cross sectional study' approach is reported by Orlikowski and Baroudi (1991). They examined papers from four mainstream American journals in respect of the time period of the study. 90% of the 155 papers adopted only one time study, while the rest of the papers are classed as longitudinal, multiple snapshot, and process traces types, accounting for 4.5%, 3.9% and 1.2% respectively. Other researchers have also addressed the time period of the study and have called for the time factors to be incorporated into social inquiry or research on organisational change associated with implementation of enterprise systems, e.g. Avital (2000) and Sawyer and Southwick (2002).

A phase model is one way to include the time factor in research. One example is Parr and Shank's (2000) work on the process model, which views the implementation as a series of "*individual, discrete phases of the project itself*" (p.289). However, other researchers agree in seeing the use of a phased model as limiting if the phases are defined a priori (Boudreau and Robey, 1999; Sabherwal and Robey, 1993). The

definition of the phases comes from the management of the project, using the idea of linear time in Ghantt charts, or from the researchers' logic, rather than from the observations (Sabherwal and Robey, 1993). Additionally, it places demands on the social processes within stages to follow a specific order in time (Sabherwal and Robey, 1995). Sawyer and Southwick agree that process research often has a linear perspective on time (Abbott, cited in Sawyer and Southwick, 2002, p.269). As such, project phases are inadequate for studying the details of the processes over time as they span over months and cover various types of activities within each phase.

However, Abbott (1995) employs sequence analysis in order to explore the temporal issues in processes, whereby 'sequence' refers to an ordered list of events. Lanzara and Mathiassen (1985) employed what they called 'maps'. According to them, maps can be used to describe situations and provide insights into possible ways of acting in those, or other similar situations. What they define as historical maps can be used to *"organise past experience in a time sequence and at the same time help one to see how events or issues are related to actions or conditions"* (p.16). The diagnostic maps on Figure 2.1, which form a part of a historic map, identify and explain disruptions to the project or in the organisation as perceived by the actors.
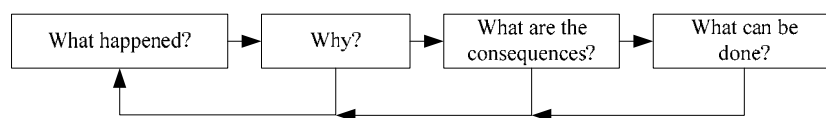
Figure 2.1: Basic pattern of a diagnostic map (Lanzara and Mathiassen, 1985)

By using the maps as described above, it is possible to break down and understand the processes which occur during the implementation project. The following section addresses how variance and process theories are operationalised in the literature.

2.1.4 Variance and process theory in use: Critical success factors in enterprise system implementation

The process theory has been used in different cases: to understand the conversion of an IT investment into favourable organisational performance (Soh and Markus, 1995), in the development of information systems, or with focus on social processes such as communication and learning (Sabherwal and Robey, 1995). Additionally, Abbott (1995) provides a review of the use of sequencing in different fields, such as psychology, archaeology, linguistics, political science and sociology.

On the other hand, when variance theory is used, the notion of critical success factors necessitates a definition of implementation project success. Every IT project could be regarded from the project management perspective as successful if it is delivered to a required standard, on budget and within the time planned. However, business process reengineering project success is proven to depend on who evaluates it - management or users; how - project perspective, business benefits or functionality; and when the evaluation is done (Larsen and Myers, 1999). One dimension of a successful implementation is the customers' acceptance of the IT system (Kuruppuarachchi, Mandal, and Smith, 2002). Similarly, Orlikowski (2000) argues that while obtaining

and implementing new technology is necessary, it does not guarantee its effective use, and in this way she differentiates between the espoused technologies which are bought and installed, and technologies-in-use which are actually used. The solution to this problem would be the allocation of resources to support the users and their evolving use of technology.

The concept of critical success factors comes from variance theory. They can be defined as "…*the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organisation*" (Rockart, 1979, p.85). Nah, Lau and Kuang (2001) identified critical success factors for enterprise system implementation by reviewing the literature, and classed them according to four implementation project phases set out by Markus and Tanis (2000). These critical success factors are:

- enterprise system teamwork and composition,
- change management program and culture,
- top management support,
- business plan and vision,
- business process reengineering and minimum customisation,
- effective communication,
- project management,
- software development,
- testing and troubleshooting,
- monitoring and performance evaluation,
- project champion, and
- appropriate business and IT legacy systems.

Kuruppuarachchi et al. (2002) identified critical success factors in the project and change management and product innovation literature which can be applied to IT implementation. These are:

- clarity of goals/ clear business vision,
- project plan,
- effective communication,
- user or customer participation,
- top management support,
- skilled team members,
- technical expertise,
- project management expertise,
- leadership of the project,

- sponsoring and selling the project,

- a work environment that is stimulating,

- cross-functional teams,

- project monitoring and control,

- a process for decision-making,

- jointly co-ordinated product development between the buyer and the seller,

- gradual change, and

- global orientation.

They did not focus on these factors in time, across the phases, but saw them purely from the variance theory perspective. However, they suggested strategies for change management in the pre-implementation, implementation and post-implementation phase of the project.

Similarly, Motwani et al. (2001) found that an "*incremental, bureaucratic, strategy led cautious*" implementation, together with "*cultural readiness*", a strong link with the vendor and "*careful change management*" contribute to enterprise system implementation success (p.94). They approached the critical success factors through a framework built on business process change management. It addresses the environmental conditions for change and the capacity of the organisation to manage the change in those conditions. They then compared the implementation approaches and the success rate in two case studies.

Poon and Wagner (2001) studied companies which were implementing executive information systems. They identified the factors to be:

- committed and informed executive sponsor,

- operating sponsor – project manager on the business side,

- skilled IT systems staff,

- selection of the system,

- data management,

- benefits of using new technology and link to business objectives,

- management of resistance due to the shift in power as a result of the system,

- management of the system expansion,

- evolutionary development methodology, and

- defined user information and system requirements.

They found that the companies either managed all of the identified critical success factors well or poorly. In only one case were the factors managed with varying degrees of success, and at the end of the implementation this company could not be judged either as a success or as a failure.

Abdinnour-Helm et al. (2003) also took a phased process approach in which they adopted the six phases from the work of Herold et al. (p.262) and studied the attitudes

of the employees in the pre-implementation phase by administering a survey. They found that pre-implementation training and involvement in the implementation and explanation of benefits of the new enterprise system did not seem to change the employees' attitudes, nor to overcome the resistance to the system. Their study shows that the demography of an organisation is an important factor that will determine the attitudes towards enterprise system implementation. Employees new to the organisation may be more receptive to new information technology, while the employees in managerial and/or professional/engineering positions may be more receptive to the potential benefits of the new technology.

Sumner (1999) looked at the critical success factors in seven case study companies, with an additional focus on project justification and failure factors. It transpired from the findings that every company had different factors which were more or less similar across the board. As the cases investigated different implementation systems - SAP, Oracle and PeopleSoft - it would have been interesting to draw the comparisons based on the type of the system implemented. Based on the same case studies she also published a paper on risk factors in enterprise system projects (Sumner, 2000). She found that ineffective communication is one of the risk factors within both the management structure and strategy, and user involvement and training categories. Neither of the papers, however, recognise time as a concept.

The key players and key activities in an enterprise system implementation were studied in the work of Somers and Nelson (2004). The data was collected by using a questionnaire sent out to IT systems executives of companies which had recently completed an implementation process, and as such, it could be classed as a retrospective study. The paper discusses the expected importance - high, medium and low - of the key actors and activities, as opposed to observed importance in time, across six implementation project stages. Interestingly, the end users do not constitute key players. This paper considers the factors during the whole of the implementation and post-implementation phases. It suggests that the importance of activities and players is not well understood in the initiation, routinisation and infusion stages of implementation. Considering the quantitative research approach, there is not enough information about what particular key factors mean to the researchers, as explanations in the questionnaire, or to the respondents. Additionally, they found that user training was important across the implementation, as well as during the post-implementation phase in order to maximise the utility of the system. Interdepartmental communication and cooperation is of high importance not only during the implementation, but also in the post-implementation phases. The majority of the respondents considered change management to be of high importance, particularly during the implementation stages. However, the responses come only from one angle, the IT systems management, and as such do not provide the full picture of different perceptions.

Related to Sumner's findings above, are the results reported by Akkermans and van Helden (2002), who built their work on the factors identified by Somers and Nelson (p.37). The results from one case study in which action research was conducted show that interdepartmental communication and collaboration became the most important activities which set the implementation project back on track. They not only investigated the factors involved, but established the causal relationships between the factors by using a mapping technique called causal loop diagramming. Additionally, the paper presents the changes in the critical success factors over time, before and after

the project crisis. Thus, rather than one using variance theory, Akkermans and van Helden's approach can be classed as one of the hybrid models.

Amoako-Gyampah (2004) focuses on comparing the perceptions of managers and end users on selected implementation factors. The study was conducted using questionnaires within one healthcare product company. The approach uses the typical variance model, and timing of any of the factors was not taken into account. It transpired that significant differences exist in the perceptions of the effectiveness of communication mechanisms, effectiveness of the training, and ease of use, among others. Interestingly, both the end users and the managers thought that the training was inadequate. In terms of the communication mechanisms, the users did not think that roadshows, demonstrations and newsletters were as effective as the managers felt them to be. The author suggests that while different activities can be used during implementation to ensure the implementation's success, it is important that managers be aware of the differences in perceptions between themselves and the end users.

In enterprise system implementations, process theory can provide better understanding of cases. According to Koh, Soh and Markus (2000), the necessary conditions for positive outcomes, such as skilled users and IT staff, are not always sufficient in bringing about positive outcomes, such as improved performance. According to the authors, looking at an implementation project as a series of stages helps in identifying 'process losses' which can occur as a result of unanticipated events. These can then escalate and cause events in the later project phases, and can ultimately result in undesired outcomes, and even an overall failure of the implementation.

Parr and Shanks (2000) claim that their project phase model is a synthesis of enterprise system implementation process models. They then investigate the critical success factors necessary at each of the phases of the project, and their criticality to project success. They view the constraints imposed by the variance theory as unachievable, bearing in mind the complexity of an enterprise system implementation, e.g. necessary and sufficient factors, and the concept of causality. However, what transpires from the paper is that their understanding of the process model is that the implementation is seen as a series of 'discrete phases' of the project. Here the critical success factors are discussed without the usual restrictions imposed by the variance theory. Hence, the paper by Parr and Shanks (2000) can be classed as a hybrid between the two theories.

2.1.4.1 The Process-based Model of Organisations as a reference framework

The implementation of an enterprise system can be regarded as a process by which an organization is transformed from an organization without an enterprise system or with legacy system to one supported by the new enterprise system (Wognum et al., 2004). However, an implementation of an enterprise system is a temporary organization in its own right. On an organizational level the implementation encompasses many sub-processes, as the project might involve several sites, and different parties such as vendors and consultants.

A way of tackling the problem of processual research based on this approach was developed at the University of Twente, The Netherlands, in the form of the Process-based Model of Organisations. The model is used to study various types of processes, e.g. manufacturing processes, new product development processes, and continuous improvement teams, among others (cited in Wognum et al., 2004, p.7). Additionally it

can be used as a reference framework in order to classify the data and to help with understanding the processes that affect the enterprise system implementation project.

The Process-based Model of Organisations comprises points of view and categories as two dimensions of the framework. The initial framework was derived from literature on the Process-based Model of Organisations. Table 1 shows the reference framework adapted from the Process-based Model of Organisations for enterprise system implementation. The points of view describe the standpoint from which an implementation process can be looked at, such as project organisation and management, business, or enterprise system implementation process. The categories or aspects of the framework provide different levels within the point of view. For example, the operational management from the project organisation and management point of view would include the project planning, while from the business point of view the new management approach, processes and tasks, and from the enterprise system point of view would include the planning of the system, phasing, review and feedback.

Concept	Project organisation and management	Permanent organisation (Business)	Change management	Enterprise System design	ES Implementation process
Environment					
Strategy and goals					
Strategic management					
Adaptive management					
Operational management					
Primary process					
Support process					
Communication process					
People Knowledge and skills					
People Behaviour					
Means					
Organisational arrangements (structure, culture)					

Table 1: Reference framework as adapted for enterprise system implementation

However, the framework shown above requires clear understanding by the parties involved in the study of the processes of what each category and point of view represents. As such, it is difficult to use[4]. If it can be simplified, it would provide a more robust tool for data analysis.

[4] As found by the BEST project team during analysis of numerous case studies.

2.1.5   Shortcomings in the use of the variance and process theories

According to Kwon and Zmud (1998) the factors research stream is the largest stream in IT systems implementation literature. However, most papers reviewed within this stream fail to show how the factors were operationalised. The only exception is the paper by Akkermans and van Helden (2002), which goes into more detail to explain how the project team succeeded by focusing on some of the major factors. In terms of the theory the researchers use, it can be observed that there are three different categories of papers:

1. papers that view factors as static in time and approach them from the variance point of view,

2. papers in which it is recognised that there are phases within the projects, and where the factors change from phase to phase - hybrid, and

3. papers which look at the factors, taking time and interrelatedness of the factors into account.

This corresponds to the findings of Shaw and Jarvenpaa (1997). However, it appears to be difficult to use the framework they developed as means of classification of the papers and authors' theoretical positioning. While it is easy to see if a particular paper falls into a category of hybrid model, it is not as easy to clearly distinguish between the different categories of hybrid model. A possible explanation for this is that the authors of the papers themselves are not as familiar with the distinctions between the types of concepts, and their occurrence and predictability, which are used as criteria of categorisation.

Additionally, there is a discrepancy in terms of what is seen to be a process theory. Some authors see the mere presentation of the implementation in phases as sufficient to take the 'process theory' approach.

2.1.6   Relevance of process theory to this research

Within process theory, different researchers see the process in different ways. Crowston (2000) defines a process as *"a sequence of events focusing specifically on events as activities performed by individual or groups"* (p.152). Boudreau and Robey (1999), when focusing on changes during enterprise system implementation, see a process as a sequence of *"events that occur over time and lead to outcomes of particular interest"* (p.293). Some authors who use process theory do not provide a clear definition of what they see as a process, e.g. Koh et al. (2000) and Parr and Shanks (2000).

For the purposes of this thesis, the enterprise system implementation process is defined as networks of discrete events, activities and states embedded in the existence of an enterprise, occurring as a result of the aim to create a functioning, new enterprise system. However, these elements of the process are not linked in a linear chain, but rather, for some events there are several elements identified as causing it. At the same time, some of those elements are causing another event, state or activity to occur. A map, similar to the maps used by Lanzara and Mathiassen (1985), was used here, with the branches spreading in both time directions from the event, both prior to and after it. The identification of the elements will come from particular individuals who are interviewed in the case study, or from the case study text written by an author in the

literature analysis. For this reason, it is assumed that not all of the elements can be identified.

Considering that this is a retrospective study, it is possible for the respondents to inform the research with better understanding of the events and possible causes in hindsight. The temporal aspect of implementation is taken into account through the network of events. However it is left to the individual to select the events that they remember as affecting the implementation (see case study protocol, Appendix A). Considering that the events are discrete, the networks run in parallel.

In this thesis, the focus is on the discrete events and their network. It is expected that the process approach will help to better understand the internal processes within the implementation project, as suggested above (Section 2.1.2). The contribution of this research is in the application of process theory to the events during the implementation, and seeing them as processes. This has not been done in the past and, as suggested earlier, is expected to provide better insights into the implementation process itself. On the other hand, understanding of the perception of the people involved in these processes is equally important, and is expected to bring to light issues that the top and project management might not be aware of, and in that way, bridge the gap between the project stakeholders.

Additionally, the Process-based Model of Organisations, as described in Section 2.1.4.1, albeit two-dimensional, enables the researcher to unravel the complex implementation process on different levels. As such the model provides a framework for data analysis.

2.1.7 The ES implementation project phases

The timing of every implementation project is of importance. Enterprise system implementation projects usually take a relatively long time and include several phases. The average duration of IT projects is from 10 to 74 months (Ebner, Hu, Levitt, and McCrory, 2002). Figure 2.2 presents the usual durations and delays of projects according to Ebner et al. (2002).

Average duration of IT project

Months

IT project size		
FP: 100	9	1
FP: 1000	22	8
FP: 10000	36	14
FP: 100000	48	26

Scale: 0, 20, 40, 60, 80

FP: Function points, measure size and complexity of software by counting and weighing functions visible to user, such as inputs or outputs; they are useful in determining relative productivity of software.

The chart excludes stopped projects.

☐ expected duration   ☒ deviation from expected duration

Probable outcome

Percent

IT project size	on time or early	delayed	stopped
FP: 100	81	12	7
FP: 1000	62	18	20
FP: 10000	28	24	48
FP: 100000	14	21	65

Scale: 0%, 20%, 40%, 60%, 80%, 100%

Examples

Enhancement to existing application (e.g. major feature in word-processing application) = 100 FP

Corporate word-processing application = 5000 - 6000 FP

Insurance-administration system = 15 000 FP

'Big-bang' CRM system = 10000 - 100000 FP

Source: Capers Jones, Patterns of software system failure and success, London: International Thompson Computer Press, 199; McKinsey Analysis

☐ on time or early   ☒ delayed   ☒ stopped

Figure 2.2: IT project outcomes and project duration (Ebner et al, 2002)

According to Markus and Tanis (2000), the implementation project has:

1. The Chartering Phase – decisions leading up to the project funding being signed off: conception of the project, building a business case, selecting the package, agreeing the project timetable and appointment of a project management.

2. The Project Phase – activities with an aim to get the system running in an organization unit or across the board.

3. The Shakedown Phase – the period from going live to the time when routine use is achieved.

4. The Onward and Upward Phase – routine operation of the business, while the benefits, if any, of the system are realised.

Each of the phases has different key players, as shown on Figure 2.3, along with typical activities and problems.

Chartering Phase	Project Phase	Shakedown Phase	Onward and Upward Phase
• Vendors • Consultants • IT specialists • Company Executives	• Vendors • Consultants • Internal IT specialists • Project Manager • Project team members • Company Executives	• Project Manager • Project team members • Operational Manager • End Users • IT support personnel • External technical support personnel	• Operations Manager • End Users • IT support personnel • Company Executive • Vendors or consultants may be involved – upgrades

Figure 2.3: Key players in enterprise system projects (Markus and Tanis, 2000)

Many researchers have used these phases in their studies of implementation, especially when looking at the critical factors (Sections 2.1.3 and 2.1.4). However, it was seen as being inadequate to describe the implementation process, which might last for several years, in only four very broad phases. It is proposed that six phases are used, which better reflect the reality of an implementation. The phases are: concept, initiation, mobilisation, deployment, project close, and operation[5]. Descriptions of the phases are shown in Table 2.

Phase	Description
Concept	The opportunity for implementation is identified and the objectives are set. The risk is assessed.
Initiation	The business case and the project plan are prepared, the risks are re-assessed and the project is signed-off.
Mobilisation	The project team is established and the resources are mobilised, project control and management are in place.
Deployment	Time for development and customisation of the system and its delivery.
Project close	The acceptance of the delivered system happens in this phase, and the handover of the responsibilities occurs. Project team disbands.
Operation	Day-to-day continuous operation of the system, with possibilities of further improvement of the system.

Table 2: Implementation project phases

These phases are adopted very loosely, only to impose a temporal structure on the implementation process. It is recognized, in line with the processual approach, that the processes would not stop for the sole reason of one phase ending and the next one starting.

2.2   Aspects of enterprise system implementation

The following section explores relevant research fields and areas in support of the limited body of literature on enterprise systems. These areas in fact form a part of the

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[5] These phases were used in the demographic questionnaire, Appendix B.

system implementation process. They include business process reengineering; change management; people in relation to change - change leadership and anxiety and concerns about change, including resistance to change; communication; loyalty and commitment; and ownership of the new IT system.

2.2.1 Business process reengineering

Business process reengineering [BPR] is very often a part of the implementation of an enterprise system. From the literature on BPR, it is actually seen that the enterprise system or IT in general, enables BPR (Champy and Wagner, 2005; Whitman and Gibson, 1997; Ahadi, 2004; Attaran, 2004). BPR is defined in many different ways. Attaran (2004) gives a definition of BPR as a radical improvement approach with the aim of enabling *"quick and substantial gains"* in organisation performance by *"redesigning core business processes"* (p.585). Ahadi (2004) defines it from a practitioner perspective as having five main points:

1. It involves radical or significant change,
2. The unit of analysis used in BPR is the business process,
3. The purpose is to achieve considerable improvements in performance,
4. IT enables BPR, and
5. Organisational change enables BPR.

O'Neill and Sohal (1999), in their review of the literature on BPR, give other five definitions of what BPR entails.

The interest in critical success factors is also as apparent in the field of BPR as it is in enterprise system implementation. Paper and Chang (2005) developed a model of critical factors for BPR based on current literature. It encompasses the factors related to organisational environment within which the BPR is implemented, the people, the methodology by which the change is implemented, the IT perspective, and the transformation or change vision and its communication.

On the other side of the spectrum is the IT as business process reengineering enabler. Whitman and Gibson (1997) were interested in unravelling the factors influencing the use of IT in BPR efforts as well as the characteristics thereof which would be of help to change agents. They conducted a survey of 24 companies and identified six factors:

1. The use of specific modelling tools for the purpose of BPR is preferable,
2. IT should support the business processes,
3. BPR should exploit change supported by IT,
4. Further IT development should support the BPR,
5. IT needs to be supported after the BPR efforts,
6. BPR supported by IT should be a part of organisational strategy.

Ahadi (2004) presents nine hypotheses in order to explore the relationship between BPR success using Electronic Data Exchange and Internet technology, and managerial and organisational factors. He found that six out of nine were confirmed, namely: the positive relationship between top management support, change management,

egalitarian organisational culture and delegation of decision making, and customer involvement. These are all positively associated with the successful implementation of BPR, while lack of resources was found to be negatively associated with successful BPR implementation.

Factors that affect the implementation of BPR in a negative way are: loss of nerve, focus and stamina, the comfortable position of senior management, lack of holistic organisational focus and settling for minor wins, human and organisational factors, culture and attitudes in the organisation, restricted resources, and fear of IT (Irani et al., cited in Al-Mashari, Irani, and Zairi, 2001, p.438). Attaran (2004) identified barriers to BPR implementation as misunderstanding of the reengineering concept, its misapplication, lack of organisational strategy for BPR, unrealistic objectives of the implementation, failure of the management to change, lack of recognition of the importance of people, and lack of IT system redesign to support BPR.

Overall, it can be concluded that the field of business process reengineering is usually one aspect of enterprise system implementation, although the researchers in the field itself consider IT implementation to be one aspect of BPR effort. The focus in the field is on business processes and their change. Hence, it can be expected that some of the factors which were identified within the ES implementation (Section 2.1.4) would be the same as in BPR implementation above. Of particular interest are the aforementioned human and organisational factors. However, it appears that the literature on BPR provides even fewer answers and insight into them than the ES literature.

2.2.2   Change management

Organisational change forms an integral part of enterprise system implementation. The change might be in the form of departmental restructuring, job description change, business process change. The change aspect of enterprise system implementation and management of this change is a necessary prerequisite which enables the users to benefit from the system once it goes live. Change management is covered from both the executive literature point of view and the academic point of view. However, both the executive literature and partly academic literature look at the change process in stages that are clearly distinguished from one another. This approach is useful from the point of understanding the overall change process and is closely related to the previously mentioned process approach when the implementation project is seen as a sequence of stages (Sections 2.1.3 and 2.1.4).

2.2.2.1 Change management from the executive literature point of view

Change is defined in the business literature as a significant difference to what was before (Davidson, 2002), while change management means taking control of change and shaping its direction and then influencing the outcome in some way (Plant, 1987).

The change process and its stages

Different authors argue that there are different steps within the change process. However, what they seem to have in common is that they view the change process as something that is planned, and which has a beginning and an end. For example, Kotter argues that there are the same stages in delivering any change, regardless of its scale (Kotter, 1996). The first period of defrosting the status quo would include establishing

a sense of urgency, creating the guiding coalition, developing a vision and strategy and communicating the change vision (Figure 2.4). The stage of introducing new practices would include empowering broad-based action, generating short-term wins and consolidating gains while changing even further, and in the last stage of this model, the focus would be on making change stick.

He also points out how important it is to follow the sequence and consolidate each step before moving forward, as there is a need to develop enough of a momentum to overcome the inertia present in an organisation. At the same time, it is important not only to manage change, but also to focus on leading change. Management involves planning, budgeting, organising, staffing, controlling and problem solving while producing a degree of predictability and order and having the potential to consistently produce key results for the stakeholders (Kotter, cited in Senior, 2002, p.222). Leading change, on the other hand, involves establishing direction, aligning people, motivating and inspiring, while as an outcome the leadership creates change which can be dramatic and/or extremely useful, e.g. new products or new labour relationships that help the firm to be more competitive.

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┌─────────────────────────────────────────────────────────┐
│              1. Establishing a sense of urgency           │
│        - Examining the market and competitive realities   │
│ - Identifying and discussing crises, potential crises or  │
│                    major opportunities                    │
└─────────────────────────────────────────────────────────┘
                            ⇓
┌─────────────────────────────────────────────────────────┐
│              2. Creating the guiding coalition            │
│  - Putting together a group with enough power to lead the │
│                          change                           │
│          - Getting the group to work together like a team │
└─────────────────────────────────────────────────────────┘
                            ⇓
┌─────────────────────────────────────────────────────────┐
│             3. Developing a vision and strategy           │
│      - Creating a vision to help direct the change effort │
│         - Developing strategies for achieving that vision │
└─────────────────────────────────────────────────────────┘
                            ⇓
┌─────────────────────────────────────────────────────────┐
│             4. Communicating the change vision            │
│ - Using every vehicle possible to constantly communicate  │
│               the new vision and strategies               │
│  - Having the guiding coalition role model the behaviour  │
│                 expected of employees                     │
└─────────────────────────────────────────────────────────┘
                            ⇓
┌─────────────────────────────────────────────────────────┐
│              5. Empowering broad-based action             │
│                  - Getting rid of obstacles               │
│  - Changing systems or structures that undermine the      │
│                     change vision                         │
│ - Encouraging risk taking and nontraditional ideas,       │
│               activities and actions                      │
└─────────────────────────────────────────────────────────┘
                            ⇓
┌─────────────────────────────────────────────────────────┐
│               6. Generating short-term wins               │
│ - Planning for visible improvements in performance, or    │
│                        "wins"                             │
│                  - Creating those wins                    │
│ - Visibly recognising and rewarding people who made the   │
│                     wins possible                         │
└─────────────────────────────────────────────────────────┘
                            ⇓
┌─────────────────────────────────────────────────────────┐
│       7. Consolidating gains and producing more change    │
│ - Using increased credibility to change all systems,      │
│   structures and policies that don't fit together and     │
│          don't fir the transformation vision              │
│ - Hiring, promoting, and developing people who can        │
│                 implement the change                      │
│ - Reinvigorating the process with new projects, themes    │
│                  and change agents                        │
└─────────────────────────────────────────────────────────┘
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Figure 2.4: The process of creating a major change (Kotter, 1996)

Duck (2001) for example, sees the process of change as having five different stages: stagnation, preparation, implementation, determination and fruition (Figure 2.5). Stagnation symptoms include slowing sales growth, low profits and a reducing customer base. In some cases, there is no sense of threat. Organisations in stagnation might be 'depressed' or 'hyperactive', and in both cases none of the efforts people make seem to make any difference. In addition to that, people in the management of some organisations might even be aware of what is happening. They might know that the change is coming but might not know what to do about it. This phase can end by

externally initiated actions such as mergers, takeovers, restructuring caused by deregulation or privatisation, etc. or internally initiated ones, e.g. a demand to change from someone in power and authority.

The next phase, preparation, starts with an announcement that the decision to change is made, and continues until the execution of plans begins. Motivation and excitement about change are very important at this stage, as is creating and communicating the vision by the aligned and energised management team, and creating a detailed plan which can be understood by others. At this stage three characteristics need to be considered: the readiness, willingness and ability to change, which can be measured by an assessment tool that the she describes. At this stage Duck also identifies the importance of the Chief Communicator, who effectively shapes the change by finding novel ways to keep his or her employees up to date on the latest information.
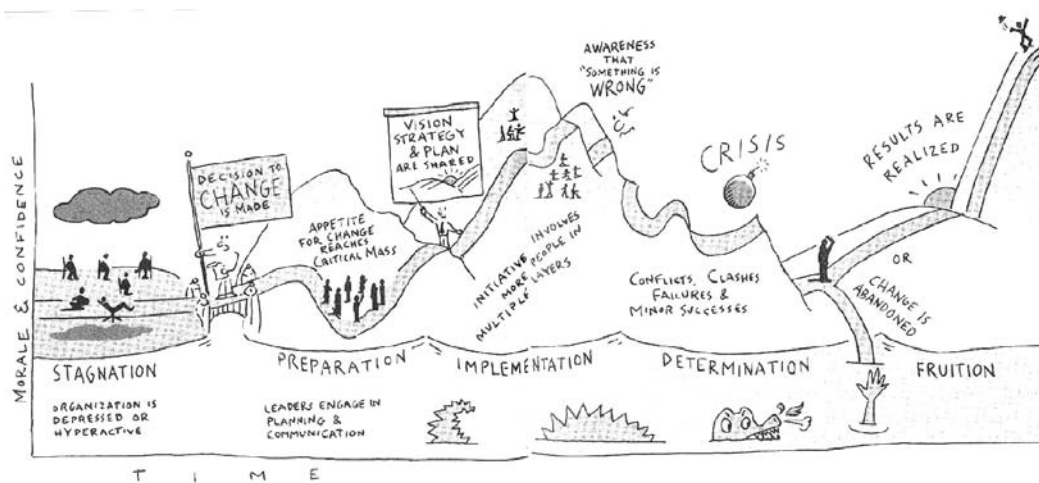
Figure 2.5: Change process seen through the level of confidence and morale (Duck, 2001)

The third phase is the implementation phase, which starts when the first pilot team is chartered and begins either with work, or with a big bang, if there is a specific event at which the plans and training sessions are announced publicly. This is the time when the management involves the rest of the organisation in implementing change and assigns tasks for the organisation to move further along the change curve. There is a need to choose what, when and where to start so that there is the highest chance of success in the required timeframe.

In the fourth phase, the determination phase, the success or failure of the change initiative is determined. Here, people start living and working according to the new rules, with the new colleagues or in the new offices. The employees start asking themselves if they actually want to stay in the company, doing the job, working with the people, what their future in the company might be, and people understand that their working lives will not change back to the way they used to be. If the employees see the answers in a positive way, they can see the value of continuing with 'embedding' the change. If they are not sure what the answers are or if they are negative, then their commitment to change lessens. This questioning often leads to the talent drain, which can turn into a serious problem, not only in the short term by the work not being done,

but also in the long term in terms of recruitment and people not wanting to start working for a company which is seen as a loser. However, if the management team admits to the workforce openly that there are problems and addresses them, it will gain commitment from the workforce, and will then be able to move on to the next and final phase.

The fruition phase starts when all the hard work invested in previous stages finally starts to bring about benefits. The employees are able to complete their work in less time, with fewer problems and with better results. The more tangible results show that the stock price goes up, sales rise, profits improve, costs go down and the company wins more customers by bringing out new products or services. At this stage there are two opportunities that could be seized: to cement the trust and unity gained throughout the organisation, and to embed the attitudes that helped the company go through the change; and to elicit what has been learnt and achieved during the process, so that it can be used in the next change process. The danger is that fruition can grow into complacency and stagnation, while the company needs to seek new ways to grow and change.

Other authors see change in a different way. For example Firth (1999) believes that there are two major components to make change happen: one being the mapped change process which includes all the activities and tasks, and the other the tools and 'interventions' that make change happen. He also defines the process of change as the vision stage, analysis stage, redesign stage, implementation stage and review stage. However, the change process is cyclical, and the goal of change is never achieved, considering that every change process brings new learning which provides new goals to aim towards.

It appears that all these models are based on Kurt Lewin's model of change, where there is a stage of unfreezing, change and refreezing as defined steps of the change process (2.2.2.2 below). However, these steps present in the executive literature try to amalgamate different levels of complexity that exist in organisations nowadays with the old change model, which since its creation has developed in a different direction, particularly within the research field of change management, and has eventually became obsolete.

In the light of enterprise system implementation, this type of prescriptive literature appears to be closely aligned to the quasi-processual model of system implementation. In these models the only dynamic that can be observed is the movement between the phases during implementation, while the other processes are not elicited in depth. It can be noted that the Project Phase, as described by Markus and Tanis (p.23 above) and the Mobilisation and Deployment phases, as described here (p.24 above) correspond to Kotter's phases of Communicating the Vision and Empowering Broad-Based Action, and Duck's phases of Preparation and Implementation. However, it is recognised that for managers and executives in charge of organisational change alongside system implementation, this type of literature might be helpful in raising awareness and educating them regarding the basics of the change process, which is something that enterprise system implementation literature does not do sufficiently well.

2.2.2.2 Change management from the research literature point of view

Similarly to the definition in the business literature, change is defined in the academic literature as *"the difference[s] between two [or more] successive conditions, states, or moments of time"* (Ford and Ford, 1995, p.543). The way in which change can occur within an organisation can be either planned or emergent (Wilson, 1992). There are two ways of looking at the planned type of change: from the processual point of view over a period of time, or from an implementational point of view - how it is implemented. Similarly, the emerging change can be studied by looking at the process of change, where change is the result of various historical, economical, and political influences, etc., or by looking at the method of implementing it within a specific context, in which powerful interests are built and operate.

There can be various reasons for change. Senior (2002) acknowledges environmental triggers of change, which might include political, economic, socio-cultural and technological factors, to which an organisation may respond in different ways. Change management can then be defined as a strategy put in place in order to control the occurrence and the process of change, as well as its results.

Lewin's Force-field analysis

This model takes into account the driving forces for change and the restraining forces against change, acting in equilibrium on an existing condition. In order to change the existing condition and reach the desired level of the condition, it is necessary to increase the driving forces, reduce the restraining forces, or do both (Wilson, 1992; Dyer, 1984). When the temporary equilibrium is de-frozen, the forces change, and induce the change of the condition, after which the system can be re-frozen at the appropriate desired level. Lewin's work on group dynamics and analysis of the driving and restraining forces has influenced some of the researchers later on (Plant, 1987), whose theory involves the appropriate set of behaviours needed to influence forces acting on a system. The criticism of this theory is that it is very simplistic, and does not seem to be applicable in a complex organisational environment.

This change model was modified by Huse in 1980 to take the complexity of change process into account (Huse, 1980), and is presented below (Figure 2.6). The first loop in the process signifies that the results of the evaluation will initiate the identification of the new goals for yet further improvement, while the second feedback loop signifies the start of the new project by the same consultant within the firm or elsewhere. The positive side of this model is that it breaks down the process into different stages. However, it is too simple to take into account the factors in the case of a few parallel change projects taking place. Also, as the pace of change in business nowadays is so fast, many of them are not fully completed, so the final stage of project termination might never be fully reached.
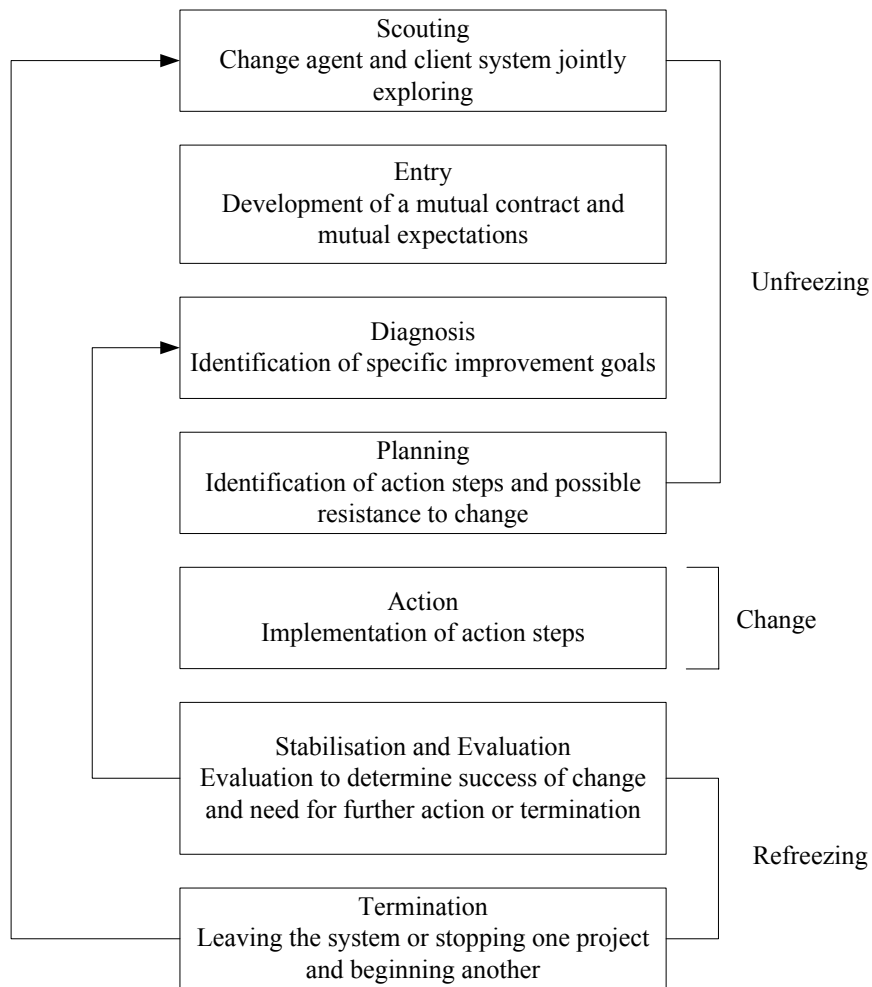
Figure 2.6: Planned change and Lewin's typology of change (Huse, 1980)

Incremental change theory

Although the incremental change model arose from the study of the health care sector (Pettigrew, Ferlie, and McKee, 1992), Quinn (1980) has done research within the private sector and has applied this theory to it. According to Quinn (1993), the strategy change process starts with the concerns which an executive vaguely feels and then thinks about over a period of time. When they think that they might have a solution, they voice this to others and discuss it with them, which brings out the good and bad aspects of the solution, and in that way, helps to refine the idea. After this stage, some resources are engaged and this idea is studied formally. When certain crises occur, the pieces of this idea are used, but with the ultimate aim in mind. However, when the final aim is achieved, it might not be the executive's initial idea, as it is possible that someone else had the same idea, which was implemented at the same time. Thus, the change process is continual and constantly evolving.

Wilson (1992) argues that the strategy of change in an incremental model is remedial and is geared towards the alleviation of the current state, but he also classifies logical incrementalism as the planned change model. According to Senior (2002), Quinn has criticised the idea of planned change as something which was thought through and then implemented.

The drawback of logical incrementalism as a model of change is that in recent years many changes have been implemented which do not follow this model, especially in the case of attempts to reduce costs and introduce more drastic reconfigurations than this model would allow. So in that respect, this type of change might be more easily understood as evolutionary, rather than revolutionary.

2.2.3   People and change

2.2.3.1 Coping with change from a managerial perspective

According to Kotter and Cohen (2002), people change because they are shown a truth which affects the way they feel. They see the challenge of change in changing people's behaviour (also Plant, 1987), and the companies which succeed in implementing large scale changes are the ones in which the focus is on changing the thinking of the people involved, so that their behaviour changes. The focus on changing people's behaviour should be present within every stage of the change process. For example, in the first stage of increasing urgency, it is on the behaviour of the people who are ignoring the fact that the world is changing; in the second stage of building a guiding team, it is on the behaviour of the people in the team to create trust and commitment; and in the third stage of getting the vision right, it is on people to create a change vision.

Duck (2001) sees the determination stage as the most dangerous for the new change initiative. At this stage the emotional and behavioural issues might not be addressed if they are seen as trivial or temporary. Alternatively, the executive team might not have enough time for vertical communication within the organisation, or might not be well connected with the rest of the employees, and they might perceive that the way they see the reality is the way it is, assuming that their own priorities are the same as those of their employees. These problems can then become worse and permeate the organisation, making the determination phase long and laborious before fruition, or even forcing the organisation to abandon the change.

Plant (1987) identified a 'soggy sponge' phenomenon, where the 'sponge' usually comprises of the layer below the top management, which is at a senior functional level. This layer regulates the vertical flow of information, and has high capacity for absorbing large quantities of information, as well as sifting through whichever pieces of information are deemed appropriate in either direction. In this way the organisation's creative energy is stifled. Therefore, apart from having the top management committed to change, it is necessary to have a certain proportion of the people from the 'soggy sponge' on the side of change. During the change process, it might even sometimes be necessary to remove some or all of the people from this layer.

At the same time, the care, time and money spent on the management of the people involved in and affected by the change is directly proportional to the likelihood of success (Plant, 1987). On one hand, people's response to change is changing and it is becoming increasingly acceptable to respond to the use of power, status and

manipulation as a means of exerting pressure and influencing people to accept the change process. On the other hand, some people cope with change better than others.

2.2.3.2 Coping with change from an individual's perspective

Goman (1992) identified the characteristics which distinguish the people who go through change successfully, from those who do not. She defines change adeptness according to five factors: confidence, challenge, coping, counterbalance and creativity. Confidence is very different from competence; people could be very competent in their job, but it is only when they are aware of their competence that they are confident in their abilities. Challenge, on the other hand, depends on the attitude. If someone sees only threats in change, their response to it will be very different from the response of a person who sees change as an opportunity. Coping with change involves not only the wisdom to know the difference between when to fight the change and when to accept it, but also the ability to be flexible, and a sense of humour that lightens up the individual and those around him or her. Change-adept individuals achieve a high counterbalance by having activities outside their working lives such as health care practices to build resilience, personally fulfilling outside interests, including sufficient time to reflect and think about values and goals, and emotional support, which could come from a reliable superior, family, a circle of friends, a church group, or God. Finally, increasing creativity and being innovative means beginning to use the brain to the full, looking for multiple right answers, cultivating diverse perspectives, learning from failure, challenging rules, and encouraging intuition.

Every individual involved in change also needs to go through stages in the change process (Goman, 1992). These stages are usually described in terms of the emotions that a person feels in the grieving process: denial, anger, fear and sadness. Elizabeth Kübler-Ross identified a change curve as a response to grief, which consists of six stages: denial, anger, negotiation to restore or recover the old situation, acceptance of the inevitable, exploring the possibilities within the new situation, and integration of the new situation in the operating framework (cited in Office of Government Commerce, 2002, p.80). The new beginning is represented when an individual begins to support the change, after they have the information necessary for them to understand the change and the reasons for it, the new goals and an overall plan of how to reach them, and their role within that plan (Goman, 1992). Davidson (2002) defines this as transition.

Mood/Energy

Denial

Anger

Integration

Negotiation

Exploring
possibilities

Dip

Time
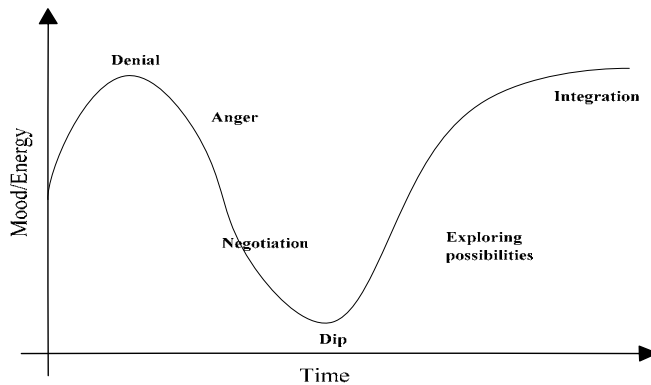
**Figure 2.7: The change curve by Kübler-Ross (cited in Office of Government
Commerce, 2002)**

Exploration of resistance to change is also present in the change literature. For example, in a review of theory and research in the 1990s on organisational change (Armenakis and Bedeian, 1999), it is stated that during change implementation, employees might experience stress, become cynical and suffer from reduced commitment to the organisation. The authors cite Clarke, Ellett, Bateman and Rugut (p.7), who worked on receptivity and resistance to change among members of university staff. They found that the staff affected by change will resist it if they perceive that they will lose something of value to them. The authors also cite Schabracq and Cooper (p.8) who argued that people develop specific automated responses to events in life. However, in the face of change, these responses, skills and behaviours are no longer effective. Due to the uncertainty of change, individuals need to develop a new set of skills and behaviours, which in turn increases stress.

Some research has been noted relating to resistance to change when it is introduced as a consequence of new information systems, and even enterprise systems. Joshi (1991) argues that a priori present resistance to change is an incorrect assumption. Using equity theory concerned with inputs, outcomes and exchange fairness, he presents the case for individuals evaluating changes, and based on whether or not they are favourable to them, the varying level of resistance. As a guideline he suggests the alteration in perceptions of inputs and outcomes which can be managed through training, communication and fair procedures. Mumford (1972) presents a method for taking into account 'human problems' when introducing new computer systems. The method includes as a first step a diagnosis of the social system, which can then be used for planning and system design. One of the propositions in this step addresses knowledge about the flexibility or rigidity in behaviour and attitudes relating to change. She stipulates that this openness to change is a result of personality, education and environment, as well as their experience of coping with change.

Further resistance to change during enterprise system implementation has been somewhat explored in work of Gunson and de Blasis (2002) and Aladwani (2001). Gunson and de Blasis (2002) studied the effects of enterprise system implementation on organisations and individuals in the workplace, based on the published ES literature. They argue that technology has its own reality, what it can and cannot do, and the social system in an organisation has its own reality. When there is a need in the organisation and technology meets it, there is no resistance. However, they point out the problem of 'techno-stress' due to employees at all levels having to adopt ever-evolving technologies. Aladwani (2001), on the other hand, sets out to demonstrate how marketing and enterprise system implementation could work in tandem to overcome employees' resistance to the system. He draws on a framework previously developed by Sheth (p.269), which points out two sources of resistance: perceived risk and habit. He stipulates that in order to change cognitive component of attitudes of future users, the management should stress the benefits of the system through communication. Additional effort should go towards ensuring support of the system by the key individuals. Unfortunately, it is not clear from the article what measures should be taken to address habit and risk perception.

Anxiety to change has also been studied by various authors. Axtell, Wall, Stride, Pepper, Clegg, Gardner and Bolden (2002) investigated the dependence between employee exposure to change and openness to change in a longitudinal study in a company where the change was a result of implementation of new technology, and where some of the employees had higher exposure to change than others. Similarly to Goman (1992) above, they argue that change was seen as threat by professionals and management in the company, but more as an opportunity by the operators, which affected the correlation of exposure to change and openness to it. They did not find a relationship between the anxiety and exposure to change. The definition of anxiety used is that it is low pleasure and high mental arousal, as opposed to depression, which is defined as low pleasure and low mental arousal (Warr, cited in Axtell et al, 2002, p.222). The lack of relationship is explained by feelings of job insecurity being equally present in the employees with low and high exposure to change.

Richardson and Denton (1996) address the importance of communicating the change from the literature perspective and through discussing reported case studies. They cite Schweiger and Denisi (p.205) who found that the group which received communication throughout a merger started to show higher job satisfaction levels, trust in management and less uncertainty than a control group not exposed to sufficient communication, which showed only decline in those factors. Additionally, they point out the timing of increased communication needed by the affected personnel as being just after the announcement of the change is made. This is also the time when the management has fewest and most unclear answers.

Patterson and Cary (2002) tested the model based on Affective Events Theory, which includes perceptions of justice and change anxiety to explicate the employees' acceptance of downsizing. They conducted a survey within an Australian public sector organisation which needed to downsize by 60% due to government funding pressures. The findings indicate that participation and support were perceived as being fair – just, and it came out that the effects of downsizing were perceived to create opportunities for achieving work-related goals. This in turn reduced anxiety about change.

2.2.3.3 On how to become a change agent

A person involved in a change process can choose two responses: reactive and proactive (Goman, 1992). Someone who has a reactive response is a good problem solver and they deal successfully with whatever problems come their way. However, to use one's creativity to the maximum and respond proactively involves anticipating new actions that will be required in future, and in that way staying ahead of change.

McConnell (2003) sees the best ways of coping with change and leading it, intertwined with the experience she gained as a social activist. According to her, change activism is about taking control at a personal level and developing an 'active moral muscle' at the time when people at the top executive level are not as trustworthy. A change activist is then a person who takes action outside of his or her comfort zone. The characteristics of a change activist are: passion for learning, clarity on all kinds of investment, identifying and building a coalition of diverse stakeholders, expecting high performance and success, a pro-active work approach in terms of organisational and market perspective, and a strong sense of personal responsibility for outcomes. The toolkit for change is a set of skills which include clarity of objective, motivation and motivational leadership, trust and care, inclusive ways of working, communication, a sense of self-esteem and worth in the world, and physical stamina.

Active thinking contributes to change activism and some examples would be: believing that each week is an open invitation to get things done, focusing on things that really matter, creating one's own luck and taking risks, trusting people, and building close relationships. On the other hand, passive thinking is: viewing life from only one perspective, giving the responsibility for one's career over to someone else, procrastinating, fearing risks, feeling low, lacking confidence and trust in people.

One of the most important factors which would determine future business success is if the company can motivate its employees to be change activists. However, this might prove difficult since many people have given up on their dreams and passions, as their ideas were not listened to and their possible contribution was not recognised. In addition to this, people standing out and not being in favour risk losing the approval of their colleagues. So the challenge then is to develop those skills in people, based on a vision of common purpose, while also creating an environment where risk-taking and innovation are seen as necessary for learning. For that to happen, people need to start thinking outside of the box and developing the ability to see a bigger picture, which is a mind-set as well as a skill.

Rees, Turner and Tampoe (1996) see a project manager as a change agent: someone who *"initiates, promotes and influences others"* (p.108). They state that leadership, as opposed to management, is one of the most *"ephemeral aspects of human behaviour"* (p. 109). Kraemmerand and Rose (2002) focused on the competencies that the managers should have in order to support the implementation of an enterprise system successfully. From one case study example and three consecutive implementation project managers they found that the managers need different competencies in different project phases. However, leadership, communication and human resource competencies are important throughout the implementation.

2.2.3.4 On people and change in conclusion

It can be noted that there is significant body of literature which deals with the management of change from the organisational management, personal and leadership perspective. What seems startling is that all the areas of change management from these perspectives are not united in terms of method of study and conclusions. For example from an individual perspective, the literature based on quantitative data seems to be devoid of the more human aspects. However, it contributes to an increased understanding of which factors are related, and in what way.

The overall impression is that all the parties involved in change are pulling in their own directions, looking after their own interests. So the real question becomes how to unite all of the actors and facilitate their working together from a more holistic perspective. Communication is then one of the basic processes which helps in achieving engagement in change. It is a powerful, if not the only, means by which the change message can be transferred between the actors, in order to activate them to work towards the same, organisational goal.

2.2.4   Communication

2.2.4.1 Communication theory

Communication can be defined as "*the process by which participants create and share information with one another in order to reach a mutual understanding*" (Rogers, 1995, p.5). Brajša (1984) suggests that interpersonal communication is a universal phenomenon which is always present. Communication is an aspect of an interpersonal relationship, an important part of it, and the means of its manifestation.

The main elements of the communication process are (Rogers and Agarwala-Rogers, 1976):

1. Source – the originator of the message,

2. Message – the stimulus that the source transmits to the receiver,

3. Channel – the means by which a message travels from a source to a receiver,

4. Receiver/s – the most important single element in the communication process,

5. Effects – the changes in receiver behaviour that occur as a result of the transmission of a message, and

6. Feedback – a response by the receiver to the source's message.

Brajša (1984) states many different ways of classifying communication. There is interpersonal, group and mass communication, where interpersonal communication can be direct, i.e. face-to-face, or indirect, spontaneous or organised, ritualised, or schematised, e.g. when the ways of communicating within an institution are determined a priori. It can be verbal, using words, or non-verbal, i.e. behavioural. Apart from conveying a message, we also determine our relationship towards the message and towards the person to whom we are conveying the message. In this way, communication has its content and relational aspect, where the latter is often expressed non-verbally (Watzlawick, cited in Brajša, 1984, p.97). It is impossible not to communicate, and so is not to convey our attitude to what we communicate and to the person we are communicating to. The receiver's acceptance of a particular message is

then dependent not only on its content, but also on the source's attitude towards what he/she is communicating, and the attitude towards the receiver.

Two-way communication can be defined as communication where the return of information is noticed and accepted so that there is a communication about the communication process (Brajša, 1984). This can be termed metacommunication. Communication needs to be complementing and symmetrical. Complementarity refers to the informing of the other of something new and their learning of what they do not know. Symmetry, on the other hand, involves the exchange of information on the same level, confirmation and synthesis of what has been communicated. There is also a difference in power or knowledge associated with these two characteristics of communication, where the former involves more power on behalf of the person conveying information, while the latter involves equality of the participants. Congruent communication refers to the situation where there is a two-way harmony between the verbal and non-verbal, and the content and relational, while accepting the complementarity without seeing it as a loss of freedom and independence (Boeckhorst, cited in Brajša, 1984, p.100). Finally, communication can be constructive and destructive (Boeckhorst, cited in Brajša, 1984, p.100). Constructive communication is that which is succinct, positive, clear, realistic, with respect to the other, open, honest and fair, with tact, in which the participants listen, avoiding interrupting and making fun of the others. Destructive communication is then full of subjective interpretations, changing subjects, blaming, blackmailing, boasting, abuse of logic, interrupting, putting down of the others, confusing, and 'guilt tripping'. This type of communication takes the source further away from the content to be conveyed, as well as from those to whom they want to convey it.

Communication channels can be defined as *"carriers of communication"* (Daft, 2003, p.582). However, each channel would have different degrees of channel richness, i.e. the amount of information that can be passed on through the channel during one communication event. Channel richness depends on three characteristics:

1. It can convey multiple cues at the same time,
2. It enables two-way communication, including feedback, and
3. It establishes personal focus.

Emotional content of communication could then be defined as the emotion of the source towards what is communicated and towards the receiver. Considering that the work relationships have characteristics that can make them distinct from personal relationships, the emotions are experienced differently (Waldron, 2000). Emotions can also be a resource through which organisational relationships are created, interpreted and altered. Buck speaks of 'emotional filters', which attribute emotional significance to events (cited in Iakovleva, 2003, p.93). Thus, paying attention to the emotional content of communication, particularly in the circumstances of expected redundancies and closures as a source of extreme emotion (Waldron, 2000), is of particular significance, and it can be very often forgotten.

2.2.4.2 Communication and organisations

In an organisational setting, formal and informal communication can be distinguished based on the structure of the flow of communication. Formal communication uses

formal communication channels which flow either within the established chain of command or task responsibility, defined a priori by the organisation (Daft, 2003). Formal communication can be either vertical, i.e. upward or downward, or horizontal, as communication between co-workers. According to Daft (2003) team communication can be classed as a special type of horizontal communication. Informal communication uses informal communication channels, which are formed regardless of the hierarchy in the organisation (Daft, 2003). The grapevine is one of the examples of informal communication network.

Communication has been the focus of some of the organisational change literature. Elving (2005) provides a conceptual framework for the study of communication during an organisational change process. He addresses communication with two purposes: to inform, and to create a community. The two types will affect uncertainty and job insecurity and all of them in turn should affect the readiness for change, and consequently contribute to effective change.

Barrett (2002) developed a Strategic Employee Communication Model, with the aim of eliciting understanding of the importance and strategic role of communication during organisational change. The model includes a three-phased communication strategy plan as well as a scorecard to facilitate the assessment of current communication practices. Operationalisation of the model is provided through a case study.

In his paper, Klein (1996) presents a case study in which he describes the change of the work measurement system that was used in the company plants. He points out the importance of hierarchical, vertical communication channels in passing the change message across. Additionally, he stresses the retention and recognition of the messages that are personally relevant to the employees only. By using the change model developed by Lewin (Section 2.2.2.2 above) he presents organisational objectives, activities and communication needs, as well as the communication principles, such as the effectiveness of face-to-face communication, or the personal relevance of interpretation, throughout different phases of change.

Lundberg (1990), on the other hand, looks at communication during organisational change from four different perspectives on organisational phenomena: rational/structural, human resource, political frame, and symbolic/cultural frame, where meaning attributed to an event is most important. These different frames co-exist and provide different ways of looking at any particular event. Lundberg discusses how different types of organisational changes relate to one of the main three organisational tasks: internal adjustment, relating to management of internal affairs; environmental alignment, related to the survival of the organisation within its environment; and future anticipation, related to organisational preparation for the future. The argument is that based on the type of change and the perspective from which the phenomena are observed, the content and process of communicating changes.

Ford and Ford (1995) see change as a phenomenon embedded in communication, without which intentional change does not occur, rather than communication being used as a tool for change. Even a simple communication produces change, albeit on a very small scale. Based on different purposes of conversation that can take place over a period of a few seconds or a few months, initiative, understanding, performance and closure conversations can be differentiated. They provide an algorithm of different types of communication throughout the change process, as well as different types of

communication breakdowns. Recommendations are given for future research to focus, among other things, on the identification of different sequences of conversations and the testing of their effectiveness.

2.2.4.3 Communication and information technology

One aspect of communication during IT system implementation projects is addressed in great detail in the stream of research which Kwon and Zmud (1998) call 'Mutual Understanding Research Stream'. They define this stream as that addressing the quality of designer-user interactions during the IT systems implementation, which is found to be one of the important factors in the Factors Research Stream (Sections 2.1.4 and 2.1.5).

An example of the work within this stream includes the work by Guinan and Bostrom (1986) who, based on previous research, raise questions about the different conceptual frameworks that system developers and users bring to the situation, i.e. different ways in which they frame the world. They criticise the research up to that point for not suggesting the variables which might explain the lack of understanding between the two parties, and propose a framework for an understanding of the communication process.

The definition of an effective communicator is provided: it is a *"person who maximises his or her goal achievement through communication"* (Parks, cited in Guinan and Bostrom, 1986, p.5). A basic communication model is given in Figure 2.8 below. Guinan and Bostrom state that the source constructs or encodes a message via their internal processes, which is then received by the receiver and deconstructed or decoded via their internal processes. Communication is effective if the message has been properly encoded and decoded. However, if the encoding and decoding are done improperly, effective communication does not occur (Berlo and Farance, Taylor and Stew, cited in Guinan and Bostrom, 1986, p.6).
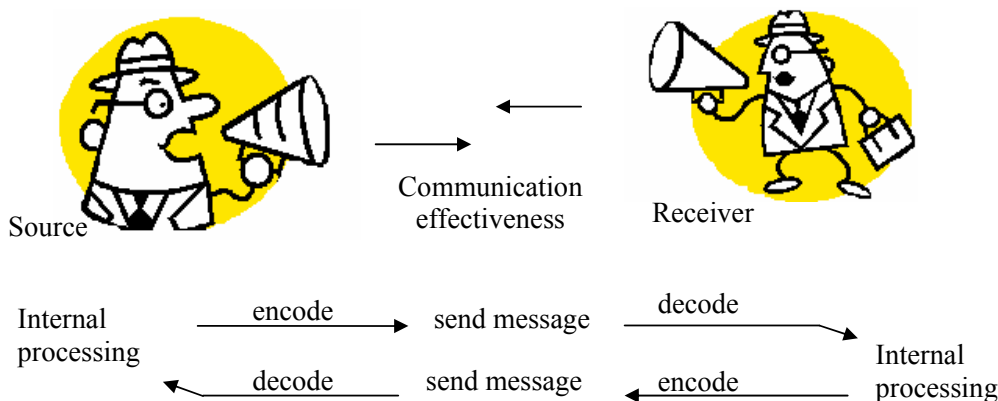
Figure 2.8: The communication process (adapted from Guinan and Bostrom, 1986)

The framework of communication provided by the authors identifies the outcomes of effective communication to be shared meaning or mutual understanding, goal achievement - obtaining a desired response, and rapport, defined as *"the harmony, accordance and congruity developed in a relationship"* (p.7). It also identifies cultural influences which might interfere with proper encoding and decoding of the messages, where misperception of a particular subculture within an organisation makes it difficult to achieve outcomes dependent on understanding of the behaviour of another subculture.

In addition, the authors identify effective communication patterns. Among others, they state vague and precise language patterns which can elicit different responses: the more precise the language, the less opportunity for the receiver to fill in their own meaning. Metacommunication as communication about communication, is another pattern and an ingredient of effective communication as it allows the participants to step back and out of the communication process temporarily and observe it (Watzlawick, cited in Guinan and Bostrom, 1986, p.11). Reframing is yet another pattern, defined as *"an attempt to change the way a person internally frames and understands events in order to change the meaning"* (p.11). The authors speculate that if the developers and the users are able to look at the problems and solutions from different frames, this is vital to the system's success.

The paper attempts to provide a framework for the effective communication process between the developers of an information system and the users. The authors criticise previous research in that it is conceptual, and while they acknowledge the fact that theirs is too, they come closer to operationalising the variables. However, although the work by Guinan and Bostrom is very useful in understanding the barriers to communication, it addresses only one portion of the communication processes during the enterprise system implementation project. The enterprise system development stage is a very important one, with the aim of aligned business processes for both the system and the organisation. However, overall communication during the project has the aim of securing the business buy-in of the new system, and user participation in the design process is not sufficient for this to happen. As such, communication activities are an integral part of the implementation project.

Sarker and Lee (2003) tested the role of three key enablers identified in the literature as important during ES implementation: committed leadership, open and honest communication, and a balanced and empowered implementation team. The case study is conducted from a positivist perspective, using process theory, where a particular condition is necessary but might not be sufficient (see Section 2.1.2). Success in project phases was evaluated as such by different stakeholders claiming or indicating through their actions that such was the case. Consequently, leadership was deemed a necessary condition for successful implementation, as when the phases were perceived as being successful, so was the leadership evaluated as a success. However the hypothesised necessity of open and honest communication and a balanced and empowered implementation team was falsified as the first two phases of the project were deemed successful but the communication was not evaluated as open and honest, nor was the team present in phase 1.

However, there are several weak points within the argument that the authors are proposing. Firstly, it is clear from the paper that leadership is operationalised through

communicating. Several of the interviewees referred back to the communication events where strong leadership was demonstrated by the communicative actions of the leaders. These were not labelled by the authors to be honest or open, although they appear to be. Secondly, the purpose of open and honest communication is not explicitly addressed in the paper at the outset. The authors seem to base their hypothesis regarding communication partly on the identified importance of communication, and partly on the importance of open and honest communication in the literature. The examples from the case where communication was not open and honest refer to providing reasons as to why certain top managers left the company, focusing on the benefits of the system rather than the drawbacks, and keeping the employees misinformed about project progress in order to preserve a good impression. This type of communication can be identified as being one-way only, with the purpose of informing, rather than enabling a dialogue. Consequently, this part of the argument needs further refinement and clearer specification. Finally, from the epistemological point of view, the positivist approach per se should incorporate observations rather than using interpretations of the participants as data.

2.2.4.4 Summary

In conclusion, the theory of communication is useful in understanding the elements, nature and role of communication processes occurring in an organisation. Even an understanding of the dyadic nature of communication helps to further the understanding of what happens during communication events related to enterprise system implementation and can help in guiding the process in practice. The work cited above contributed by developing alternative models, frameworks and perspectives of communication which correspond to what is encountered in practice and is related to change management. As such, they are useful in better understanding the communication processes and their role during enterprise system implementation. Additionally, some works were of a prescriptive nature, e.g. Lundberg (1990), or portrayed a very different picture of the relationship between change and communication as one of the possible interpretations, e.g. Ford and Ford (1995).

However, the literature on IT systems has thus far focused mainly on the communication process between the users and developers in the form of end user participation. Communication processes occurring during the implementation of an enterprise system have been scarcely studied in depth. An exception is the work of Sarker and Lee (2003) who falsified a hypothesis that open and honest communication during implementation is a necessary condition of success of the implementation effort. These findings, and the limited study of communication processes and their utilisation during enterprise system implementation, in tandem with it being identified as one of the critical factors (Section 2.1.4), call for further investigation of the communication process in context.

2.2.5 Commitment

Commitment has been defined as the "*employee's emotional attachment to, identification with, and involvement in the organisation*" (Meyer and Allen, cited in Postmes, Tanis and de Wit, 2001, p.228). Schwenk (1986) distinguishes between commitment to an organisation and to a course of action. He cites Porter et al., who define organisational commitment as a "*strong positive attitude toward an organisation*

accompanied by behavioural intentions to work hard on behalf of the organisation and remain in it" (p.299). Commitment to a course of action is *"a state of being in which an individual becomes bound by his actions and through these actions to beliefs that sustain the activities and his own involvement"* (Salanick, cited in Schwenk, 1986, p.299). When it comes to new technology implementation, commitment can be defined as *"the degree to which the employees are receptive to technologies and system"* (Chen, Gupta and Chung, 1996). However, this definition is somewhat deficient as the employees' receptivity is passive, rather than expressed in any form of action.

Commitment has been studied to a certain extent in the context of change management. Paterson and Cary (2002) link commitment to the organisational change efforts when users participate in designing change, and thus experience the feeling of control, based on work by Cummings and Worley and Kanter (p.85). Armenakis and Harris (2002) argue that every change message has components which affect and form employees' motivations towards the change. In order to secure resources and commitment, a message needs to have one of the components, termed 'principal support', which involves a demonstration of support early on and on a continual basis.

However, the study of employee commitment is significantly broader and covers various contexts. Some examples include dual commitment to the organisation and union (Kim and Rowley, 2005), multiple commitments to the organisation and co-workers, the union, the union representative, customers, and the line manager (Redman and Snape, 2005), escalation of commitment (Sabherwal, Sein, and Marakas, 2003), commitment and motivation (Meyer, Becker, and Vandenberghe, 2004), and commitment to the implementation of flexible manufacturing systems (Chen, Gupta and Chung, 1996).

Sabherwal, Sein and Marakas, (2003) have addressed factors influencing managers' commitment to an IT system project: project related, psychological, social and structural. Project factors relate to the investment in the project so that the large pay-off at low cost and project seen as a long-term investment are both favourable in terms of increasing commitment of the decision makers to the project. The psychological factors studied by the authors are personal responsibility – depending on whether the person initially responsible for project sign-off is still involved in the project, and framing of the project status – in a positive or negative way, e.g. the percentage of satisfied users, or the percentage of dissatisfied users. Social factors relate to the group setting the individual is in, e.g. the individual's identification with the project and responsibility for project failure. Structural factors include political support and costs incurred, which are related to the project but are not directly a part of it.

Chen, Gupta and Chung (1996) studied the effect of five factors, namely educational opportunities, job discretion, management support, job security and financial incentives, on employee commitment during the implementation of flexible manufacturing systems. The study was conducted in six companies and involved mainly questionnaires and follow-up interviews. They found that only educational opportunities significantly affected the level of employee commitment. A lack of relationship between job security and commitment was explained by the appropriate education techniques counteracting the uncertainty about the future position.

Postmes, Tanis and de Wit (2001) studied the type of communication in relation to organisational commitment. Based on two case studies and questionnaires administered

to the employees, they found that vertical communication, in contrast to horizontal communication among the co-workers, is more strongly related to organisational commitment. In the second case they also measured the effects of types of communication on commitment to the organisation and to the unit. Their findings show that vertical unit communication is a predictor of unit commitment.

In summary, it can be noted that various forms of commitment exist within an organisation implementing an enterprise system. The above literature can provide a limited insight into enterprise system project commitment. The forms of commitment would include managers' commitment to the project, employees' commitment to the enterprise system implementation project and the project manager, employees' commitment to the department, and employees' commitment to the organisation. Additionally, the employees have different levels of involvement in the project. They can be involved as key users or they can have less involvement, or no involvement at all as end users. In the case of key users, the question that can be raised is if the end users object to the system or are ambivalent, how the key users deal with conflicting commitments, to the department and their co-workers on one hand, and to the organisational and project aims on the other. Issues such as these have not been found in literature.

2.2.6 Transfer of ownership from the top management to the end users

Employee ownership has been studied by many researchers within an organisational context. The initial studies, however, are predominantly related to legal ownership of the organisation by its employees. Only Avital and Vandenbosch (2002) below have studied the issues of psychological ownership of an IT system and business processes.

In the context of employee legal ownership of an organisation, the ownership is defined as:

> "…an organisational arrangement in which there remains a clear separation between managers and workers, where shares of ownership are not necessarily distributed equally, and where a significant proportion… of the people who work in the firm, regardless of hierarchical level, or whether compensated by salary or hourly pay, possess ownership in the employing organisation" (Rosen, Klein and Young, cited in Pierce, Rubenfeld, and Morgan, 1991, p.122).

However, Pierce, Rubenfeld and Morgan (1991) suggest that this type of ownership operates from both a "*formal and psychologically experienced platform*" and that the formal ownership affects attitudes and behaviour of the employees through a state of ownership that is experienced psychologically (p.126). They propose that the psychological ownership will affect the integration of the employee into the experience of ownership, which should affect their commitment to the organisation. However, recognising that the developed model is exploratory in nature, the authors speculate that there would be a reciprocal relationship between commitment and psychological ownership.

Van Dyne and Pierce (2004) distinguish between organisational commitment and psychological ownership of an organisation. Psychological ownership partly consists of an attachment to the organisation which is of an emotional nature. So the question an employee would ask is "How much do I feel that this organisation is mine?" However,

if one questions one's commitment to an organisation, the question is "Why should I continue being a part of this organisation?" The bases of the two concepts are different, where ownership relates to possession, while commitment relates to the need or desire to remain in the organisation. The authors found that psychological ownership positively affects organisational commitment.

In terms of ownership and organisational change, psychological ownership will affect resistance or promotion of change, depending on the type of change (Dirks et al, cited in Pierce, Kostova and Dirks, 2001, p.303). If change is imposed, thus threatening the employee's sense of control, revolutionary and subtractive, thus diminishing the essence of what an employee is attached to, the employee will resist the change. Based on this, Pierce, Kostova and Dirks (2001) propose that if the change is self-initiated, evolutionary and additive, the psychological ownership that an employee experiences towards the organisation will result in the promotion of change.

Avital and Vandenbosch (2002) propose a model where employees experience psychological ownership of the IT systems as well as the business processes, while the IT specialists experience ownership of the business processes in addition to the IT system. They suggest that user participation strengthens only the employee ownership for the IT system. However, in enterprise systems for example, it is impossible to disentangle the IT system from the business processes and configure the system without the knowledge of the business processes. The authors conducted interviews in renowned and averagely performing companies and found that in renowned companies, the indications of ownership both in users and IT specialists was high, as opposed to that in averagely performing companies, where it was low.

Three aspects of system ownership and its transfer have been addressed in a practitioner paper by Stapleton and Rezak (2004). The transfer of the system is from the project team who developed it to the end users and involves the transfer of knowledge, responsibility and vision.

In conclusion, the issues of psychological ownership of the system have been addressed from the organisational point of view. However, the ownership of the enterprise system during its implementation, the ownership of the implementation process, and the ownership of the further system development have not. Additionally, the transfer of these types of ownership as a process is particularly unclear, as is the organisational recognition of the transfer.

2.3   Conclusion

Literature has shaped the research agenda in terms of providing the foundation of existing knowledge on which to build further. It provides the insights into the practice and the way practice is seen, as well as the tools for data collection and analysis. More specifically, it can be concluded that in order to achieve research objectives and answer the research questions, it is appropriate to use process theory to investigate the process of implementing an enterprise system. However, the focus here is on processes rather than on the conditions sufficient for a particular event, state or activity to occur. The research specifically related to enterprise system implementation is limited in terms of application of process theory as opposed to variance theory. However, both approaches were presented towards achieving objective I and in support of the findings towards

achieving objectives II and III (Section 1.3). A map of events (Section 2.1.3) is deemed useful to support data collection. This choice is towards objective VI.

Additionally, literature contributed towards the shaping of research question 5, relating to the extent the communication occurrences are perceived by the employees to affect the transfer of ownership of the system. The other two themes: anxiety about the change, and employee commitment originated from the first stage of research and were supported by literature. These three themes transpired as predominant in the implementation process leading up to the go-live.

Other aspects relevant to implementation of enterprise systems are included here, for the reasons of better understanding the elements of the implementation, such as business process reengineering and change management. Additionally, the change management literature provides a better insight into various people issues, such as anxiety about change, which are directly relevant to objective V. Project management literature was considered, but has proved predominantly prescriptive, and not contributing towards answering the research questions.

The area of communication is presented in more depth from the perspective of communication theory as well as from the research on communication in organisations and related to IT systems. This area is of particular relevance in achieving objective IV, and partially objective V. Finally, the commitment and psychological ownership relevant to objective V are also presented, albeit from an organisational perspective, due to limited literature related to IT systems and their implementation. Literature on end user – system developer communication was considered, but in general found to be very limiting as this interaction forms only a part of the overall implementation project.

Following on from the above, the question that arises concerns how to research this area of interest, in order to obtain data that would support achievement of the research objectives. What is the nature of reality and knowledge? How can they be studied in the field of IT systems? How can they be studied in order to answer the research questions? These questions are answered in Chapter 3.

3 RESEARCH METHODOLOGY

In order to answer the research questions, a reliable, systematic and transparent research method needs to be utilised. This section presents the issues related to the research method that need to be addressed when conducting research. The foundation is about the nature of knowledge and the method of inquiry in IT systems research. The sections that follow relate to the building blocks of research based on this foundation. The aim of the chapter is to understand and present those building blocks in a clearer light.

As the field of interest in how to conduct research in the areas of the social sciences and IT systems is as diverse as the members of the research community itself, it appears that a standardised, common language is absent. The lack of such language and commonly agreed upon terminology makes the study of this field laborious.

What is suggested in the following sections presents a picture of the research philosophies, methods, approaches and techniques. It aims to present the most prevalent and frequently used building blocks of research, to compare and contrast them, and to highlight the specific choices made within this research project. The research choices are explained below and highlighted on Figure 3.3 in contrast to the options available but not taken. In addition to this, the issue of validity of research is addressed.

3.1 Perspectives in IT systems research

The literature on IT systems research methods shows that there has been a long term debate about the plurality of research perspectives, and which of these perspectives are most suitable for the IT systems research. Several authors have studied the types of articles published in prestigious IT systems journals and in proceedings of IT systems conferences, particularly with respect to the dominant set of assumptions which inform IT systems research (Schwartzman, 1993; Agar, 1986). The design of research was studied, as well as its epistemology. Epistemology is concerned with the nature of knowledge and the methods of inquiry (Strauss, 1987). Orlikowski and Baroudi (1993) classified articles by epistemology as positivist, interpretive and critical, according to the classification put forward by Chua (1987). The paper defines them as:

- Positivist – a priori fixed and observable or measurable relationships exist which are investigated with structured tools. These studies are used to test theories, and the classification criteria used are: evidence of formal propositions, quantifiable measures of variables, hypotheses testing and the drawing of the inferences about a phenomenon from the sample to the population.

- Interpretive - people create and associate their subjective meanings as they interact with the world around them. The phenomena are understood through accessing the meanings that participants assign to them. The intention is to gain a deeper understanding of the phenomenon, which can then inform other settings, rather than to generalise. The classification criterion was the intention of the research to increase understanding of the phenomenon within particular situations, where the phenomenon is studied in its natural setting from the

participants' perspective and where the researcher did not try to impose his/her a priori understanding of the situation.

- Critical – exposure of structural contradictions within social systems allows the critique of the status quo which transforms the social conditions. Criteria for classification are a critical stance to assumptions about organisations and IT systems, and an analysis attempting to reveal the nature of existing social practices.

They found that out of 155 articles and papers published between 1983 and 1988, 96.8% had positivism as the dominant epistemology, while only 3.2% were interpretive. There were no critical studies.

Alavi and Carlson (1986) conducted a more extensive study of 908 articles published between 1968 and 1988. Empirical articles are defined as those that "*capture the essence of research by relying on observation*" (Van Horn, cited in Alavi and Carlson, 1992, p.47). They found that field studies comprised 33.4% of the empirical articles [48.8% of the total], while the laboratory experiments accounted for 15.1%, and case studies for 9.1%. On the other, more recent, side of the spectrum are Galliers et al. (cited in Mingers, 2001, p.248) who conducted a survey of IT systems academics in the UK to find that many [41%] use case studies, interviews and qualitative analysis. In terms of the epistemology used among the respondents, the most common was interpretivism [40%]. This leaves many questions open, particularly regarding the evolution of IT systems research and the possible difference between the approaches accepted for the specific journals chosen for the study, and the prevalence of approaches in the UK.

In terms of the research methods used, Alavi and Carlson (1986) assert that the adoption of a plurality of research perspectives, rather than adhering solely to positivism, would enhance the progress in the field. Mingers (2000) for example, is in favour not only of pluralism of research perspectives within the discipline, but of routinely combining the different research methods from different research perspectives in order to achieve better and richer results. Silverman (1995) argues that instead of focusing on what people perceive to be done, it is important to understand what *is* done. Opposed to that is Gummesson's (2003) view that all research is interpretive, as both numbers and words require interpretation. He believes that the debate takes the researchers away from what is really important - the techniques to support access and validity among others.

This research was conducted from an interpretive perspective. In interpretive research, it is not important to verify that what was perceived to have been done was actually done. However, it is important to understand how what was done was perceived by the people involved in or affected by the implementation of the system. Additionally, the actions taken by the actors in the enterprise system implementation project were studied retrospectively. There was neither the opportunity to verify that particular events took place nor an attempt to do so. As it is seen as important how particular events were perceived and what their effect was or was perceived to be, it was deemed to be irrelevant and impossible to study the events objectively, as none of the actors would have a complete knowledge of what was happening. The interpretive perspective is deemed most suited and most appropriate perspective to take in order to answer the

research questions (Section 1.3) and in the light of the background to the research problem (Section 1.2).

3.2   Research approach: Quantitative and qualitative

The research method is used in order to ensure that reliable knowledge is obtained through the research process. The method used in research is directly related to the prevailing epistemology. Sometimes, the terms related to the method and the epistemological positioning can be seen as interchangeable, e.g. when the authors refer to quantitative, positivist research methods (Straub, Gefen, and Boudreau, 2004). Straub et al. (2004) argue that quantitative research can only be based on the positivist research perspective. On the other hand, Myers (2004) argues that qualitative research can have any underlying epistemology – positivist, interpretive or critical. This is presented in Figure 3.1.
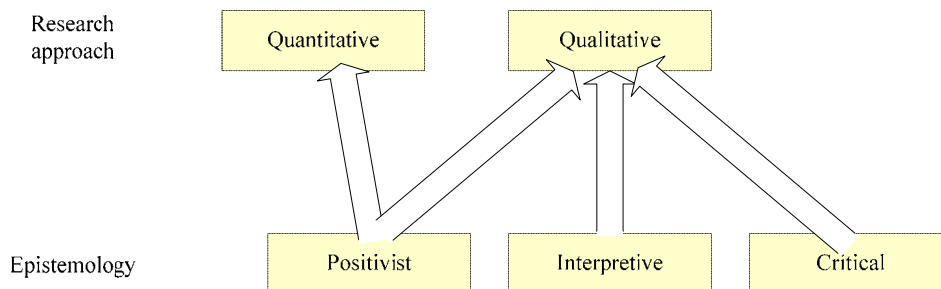
Figure 3.1: Relationships between epistemology and research approaches (Straub et al, 2004)

Quantitative research deals with quantities and the data is always analysed numerically (Johnson and Harris, 2002; Straub et al, 2004). Statistical analysis of data is usually utilised in this type of research, and the numbers then explain the phenomenon (Straub et al, 2004). Johnson and Harris (2002) classify quantitative research into three categories: descriptive, comparative, and prescriptive. Descriptive research attempts to explain a phenomenon by using numbers. Comparative research compares the statistical data relating to more than one group, where there are dependent and independent variables. The differences in independent variables between the groups are then seen to affect the dependent variables. Prescriptive research has prescription as its objective. The model for prescriptive research is that there is a cause and effect, and that this relationship can be described in the form of mathematical equations.

The advantages of quantitative research include theory testing, replicability and generalisability (Johnson and Harris, 2002). However, in order to be able to test a theory, it is necessary to have enough knowledge of the phenomenon already to be able to test the constructs, variables and relationships. In order to make quantitative research replicable it is also necessary to have a structured data analysis process, where data is less dependent on the researcher's interpretation (Johnson and Harris, 2002). Appropriate sampling should address the issue of generalisability and allow for the responses to be generalisable to a specific a priori defined population.

Johnson and Harris (2002) also argue against the common perceptions of quantitative research. One of them is that quantitative research is seen as objective, while they believe that the subjectivity in this approach is in the scales included or not included in the questionnaire, the sampling, and the data which is the focus of research. Another is an illusion of precision of the type of data. They give an example of using the scales where we might wonder what a 3.27 mean score represents if scale point 3 is 'no strong feelings' and point 4 is 'disagree'.

Qualitative research is that where the data obtained is in the form of words and observations, rather than numbers (Johnson and Harris, 2002; Miles and Huberman, 1994). The advantages of qualitative research are that it requires in-depth data which gives descriptions and explanations placed in a particular context, and as such can help in generation or revision of conceptual frameworks. One of the major advantages is that, apart from answering the initial research questions, qualitative research can provide answers to research questions not originally asked (Johnson and Harris, 2002). Additionally, the research can be conducted in order to compare two sets of data and reveal similarities between processes.

The disadvantages of qualitative research are the length of time and effort required for data collection, data overload, the possibility of researcher bias, extensive data processing and coding, reliability of sampling methods, generalisability of findings, credibility of conclusions and the lack of methods of analysis (Johnson and Harris, 2002; Miles and Huberman, 1994). However, some of these issues, e.g. generalisability, would only be raised by researchers using quantitative research approach and would not be as relevant to a qualitative researcher.

The debate between the use of qualitative and quantitative research methods is ongoing. However, Bryman (1988) argues that there are situations where the differences between the quantitative and qualitative approach are technical rather than epistemological. Silverman (1995) argues that both quantitative and qualitative research neglect people interaction, and that both are more concerned with the environment around the phenomenon than with the phenomenon itself.

Both qualitative and quantitative approaches were adopted in this research. The qualitative analysis looked more deeply into what the events were, how they interrelated, and the perceptions of the participants. The quantitative analysis looked into the number of occurrences of a specific category of events or states, but was based on the qualitative data. In the light of the research questions and objectives, qualitative approach was seen as the most appropriate as it is adopted towards answering the research questions (Section 1.3). Quantitative approach as a part of the overall research strategy was deemed as appropriate to show the importance or the predominance of one category of elements of the process – events, states, activities, over others. This in turn helps in putting into perspective which elements of the process are seen as more important.

3.3   Fixed and flexible research design

According to Robson (2002), flexible and fixed designs are better descriptions of research design than qualitative and quantitative research. In the case of fixed design research, the design needs to be established prior to data collection. The specific method needs to be decided upon at the early stages. In the case of flexible research,

the design emerges and develops during data collection, so the techniques used for data collection can change during the research.

The design of this research was of a flexible nature. It was developed during the research process, in the light of the findings and additional input from the participants and experts. This decision was made in the light of the above reasons (Section 3.2) as well as being seen as a part of the developing research process, where the initial approach and the tools used for data collection needed further moulding in the light of the feedback of the involved parties and based on the findings.

3.4   Researcher role in data collection

The researcher can be directly involved in the data collection process. In this case, the data collected is primary data. However, there are many cases of the reuse of other researchers' data. Secondary analysis is the term used for re-analysis of someone else's data (Rosenthal and Rosnow, 1991), and secondary data constitutes data collected by another researcher (Blaikie, 2000). Meta-analysis is a type of secondary analysis which summarises and combines the results of a number of studies (Rosenthal and Rosnow, 1991). This type of research study usually refers to analysing datasets.

Hakim (1982) identifies different sources and types of quantitative data, including censuses and datasets derived from administrative and public records. Secondary analysis of quantitative data is used in behavioural science, social research, economic research and in determining geographical patterns and variations within countries or internationally. In contrast to this, Weber defines content analysis as a *"research method that uses a set of procedures to make valid inferences from text"* (Weber, cited in Neuendorf, 2002, p.10).

Yin (1994) recognises the use of both numerical and non-numerical data for further analysis, and Corti (2000) points out that there has not been enough evidence to date about successful reuse of qualitative data compared with the evidence for survey data and historical texts. This affects the perception of the researchers and their willingness to use qualitative data for secondary analysis.

Both primary and secondary data were used in this research. Primary data was collected by the author being directly involved in the research process. Secondary data was also analysed. In this case, data came from descriptions of cases of enterprise system implementation or experiences of projects published by other researchers. Primary data was collected as major source of findings as it is taken directly from the context. However, secondary data is seen as useful to provide more findings from the research which has already been conducted.

3.5   Research strategy

An additional distinction can be made between deductive and inductive research strategies. According to Blaikie (2000), research strategies provide a set of steps in order to answer the research questions. Figure 3.2 shows the direction of the steps to take from the starting point to the end point. Deductive research starts with a theory or a concept that requires explanation. Starting from hypotheses deduced from theory, the data is found to either confirm the hypotheses, and in that way support the theory, or, if

the data does not confirm the hypotheses, the theory needs to be appropriately modified or rejected (Blaikie, 2000).
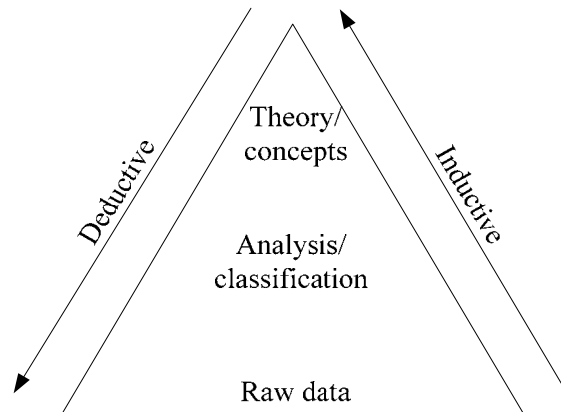
Figure 3.2: Inductive and deductive strategies[6]

Inductivism is defined as a doctrine according to which science and scientific theories are a result of the field of knowledge of empirically established facts (Bryman, 1988). Inductive research strategy then involves the building of theories based on the data.

Blaikie (2000) identifies an additional strategic category as retroductive. This strategy starts from a similar point as deductive, from the point where a specific theory, or regularity as he calls it, exists, but then the strategy leads to uncovering the reasons and causes for the regularity. In order to discover the reasons and causes, the researcher needs to create hypotheses about the reasons for this regularity to be in existence, and then confirm or disprove the hypotheses.

Gummesson (2000) and Bryman (1988) argue that the starting points of research may be different, but that after the initial stages, all research is a combination of inductive and deductive, as the researcher goes through the stages of iteration and refinement of the theories and data collection and analysis. The term Gummesson (2000) uses for this process is abductive research strategy. However, Blaikie (2000) defines abductive research strategy differently. He defines it as having different logic to deductive, inductive and retroductive research. The researcher needs to abstract the actors' motives and reasons for activities into "*typical motives for typical actions in typical situations*" (p.25). The end point of this strategy is to provide an understanding of the activities seen through the lens of actors and the way they see their own motives and reasons.

The strategy taken in this research can be described as retroductive, according to Blaikie (above), as the regularity which exists – a failure of enterprise system implementation, is then studied to uncover the reasons and causes for its existence.

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[6] This is a slide from the presentation given by Mark Lemon on Background to qualitative research at Cranfield University, spring term 2003-2004.

However, when the causes were identified, further research followed inductive strategy to build theories from data. This coincides with flexible research design as defined above, as the author took into account the findings from the scoping phase of the research and then focused the research efforts in one area of particular interest.

3.6   Research methods

Robson (2002) describes experimental and non-experimental design as forms of fixed design. In the case of experimental design, the participants are in different conditions where the researcher can influence the independent variables. This affects the dependent variables, which are measured, and all other variables are controlled. Non-experimental fixed design is very similar to experimental design, but the independent variables are not, should not – for ethical reasons, or cannot be directly influenced by the researcher.

He classifies case study research, grounded theory and ethnography as *"influential design traditions"* in flexible design inquiry (p. 164). However, the notion of trustworthiness of findings coming from this type of research is raised as the subject of much debate. This is addressed in Section 3.9.

Yin (1994) states that case studies, as a means of research, can satisfy the desire of a researcher to better understand complex social phenomena, while retaining the bigger picture and meaning of the events. As such, a case study is an enquiry exploring a contemporary phenomenon within a context, in which the boundaries between the two are not clearly evident, or in which the context might be relevant to the studied phenomenon.

When selecting a research method, it is important to have the research questions, the control over the events and the timing of the events in mind (Yin, 1994). Case studies can be used in a current setting or when dealing with past events, where the witnesses or people involved in them are still available to report, while there is no need to control the behaviour of events. The case study is best used with research questions which start with "how" and "why", as an explanation of operational links, rather than frequency of incidents. However, for "what" questions, where "what" refers to exploration, an exploratory case study can be used in order to develop a hypothesis or ideas for further research. According to Gummesson (2000), case studies are a good method for studying company processes, as well as for exploratory, descriptive and explanatory purposes.

The grounded theory approach was developed by Glaser and Strauss in the '60s. It uses a set of steps – procedures, in order to build a theory that is grounded in data. According to Robson (2002), grounded theory originated as a reaction to the usual sociological approach of the '60s, in which the research strategy was deductive, with its starting point in theory. Glaser and Strauss had as an aim to develop a method for data analysis which would be systematic and explicit (Strauss, 1987). Robson (2002) states that the benefits of the method include its usefulness in the areas of research where the theoretical approach is not developed. However, he also points out that any research needs some pre-existing theories and that there might be a tension between the evolving and inductive strategies as opposed to the systematic approach to data analysis which the grounded theory method requires.

Hammersley and Atkinson (1995) suggest that social scientists have felt the tension between the methods applied from natural sciences and the complexity of the social world and how it can be studied. According to them, the ethnographer immerses him or herself in the daily lives of people for a considerable length of time in order to understand the research problem and find answers to research questions. Agar (1986) defines ethnography as a *social research style that emphasises encountering alien worlds and making sense of them"* (p.12). This method developed initially in order to understand different, foreign cultures, and then in the 1930s and '40s it started to gain ground in organisational research (Schwartzman, 1993). Robson (2002) states the difficulties of using the ethnographic method to be: the ability to understand the concepts used in socio-cultural systems and apply them in descriptions, analysis and interpretation of the studied culture; time consuming; narrative writing style which might not be suitable for a social scientist; and the researcher abandoning the study and becoming a part of the studied group.

The method of inquiry for the collection of primary data was the case study. It is deemed that the study of several cases in depth, as the case study method of inquiry would allow, achieves the objectives and answers the research questions on the meso-level of studying processes occurring between people (Section 1.3). It is seen that ethnography and grounded theory approach are alternative approaches when a flexible research design is used. However, ethnography would not be suitable for use on the level of inquiry that was of interest, but might be helpful to reveal social forces in the context, for example. Grounded theory approach was discarded as a significant body of knowledge already exists from the variance theory perspective, related to the factors influencing the implementation of an enterprise system

3.7   Techniques in research design

Robson (2002) suggests that the technique should be decided upon according to the research questions asked and the research strategy chosen. He classes techniques into direct observation, interviews, questionnaires, attitude scales and standardised tests, which vary according to what the researcher wants to find out – what people do in public, privately, or how they think or feel, or about their personality.

Interviews and focus groups or workshops were the main techniques for data collection in this research. Further data was collected from the case documentation, such as presentation slides, project documentation, company reports, newsletters and annual reviews. Interviews were chosen as the most suitable method for data collection in order to achieve the objectives and answer the research questions (Section 1.3) and in the light of the above choices on research method, research approach and design.

Researcher role in relation to the setting	External/observing	Etic			Emic	Internal/ participating
Techniques for data collection	Questionnaire	Standardised tests	Participant observation	Interviews		Focus groups
Research method	Survey	Experiment	Case study	Action research		
Research strategy	Deductive	Inductive	Retroductive	Abductive		
Research design	Fixed	Flexible				
Research approach/data	Quantitative	Qualitative				
Researcher role in data collection				Primary		Secondary
Epistemology	Positivist	Interpretive	Critical			

Figure 3.3: Research choices (adapted from Straub et al., 2004)

3.8 Researcher role in relation to the setting

The researcher can take on different roles in relation to the setting where the data is collected. He/she can act as complete participant or a participant-as-observer (Nachimias and Nachimias, 1981). Robson (2002) adds two more distinctions: the marginal participant and the observer-as-participant.

A complete participant is a researcher who becomes a full member of the group studied but whose role is concealed from the group (Robson, 2002; Nachimias and Nachimias, 1981). This is often justified by an expected refusal of the group to take in the researcher or by the behaviour of the group members changing due to the presence of the researcher. The participant-as-observer role can be defined as the one the researcher takes when the group is informed about the researcher's intention to observe the group (Robson, 2002; Nachimias and Nachimias, 1981). Then the researcher's focus shifts to establishing a relationship with the observed, who become informants and respondents (Nachimias and Nachimias, 1981).

The marginal participant is a researcher who observes the behaviour of the group studied, but with a lower degree of participation than a participant-as-observer (Robson, 2002). Robson (2002) gives an example of a researcher in the role of a marginal participant as a spectator in the audience at a concert. Finally, the researcher in the role of an observer-as-participant does not take part in the group activity, but his or her status as a researcher is known to the group members (Robson, 2002).

The researcher's role in relation to the setting in this research could be classed as participant-as-observer. The participants were fully informed of the research project. However, the researcher did not participate or observe the usual activities of the group. By the fact that an interview is a dialogue between a researcher and an interviewee or participants of the focus group, it can also be argued that the researcher initiated and imposed the activity of an interview or focus group, including the questions that were asked, on the actors, for the purposes of data collection. Again, this choice was made to achieve the depth of the study and in the light of the interpretive research perspective which was taken.

In addition to the researcher roles above, a distinction should be made between 'emic' and 'etic'. This terminology originated in the work of Kenneth Pike in 1954, who coined the terms from the linguistic terms 'phonetic' and 'phonemic' (Headland, 1990). Phonemic refers to any unit of a particular sound – phoneme, in a language, while phonetic refers to the linguistic system that is devised externally - by the linguists, to represent the phonemes. Some researchers refer to emic as an insider perspective and etic as an outsider perspective, e.g. Hodder (1994). However, these terms tend to be used in a variety of ways in anthropology and other sciences and Headland (1990) presents a brief review of their different uses.

In terms of the distinction between the emic and etic relationship to the setting in relation to this research, it was necessary to initially adopt an emic approach in order for the researcher to be able to understand the participants. Each participant would have their individual language and a way of expression, depending on their personal experiences and background, the department they were in and the company they worked for. For a researcher to be able to understand these different 'languages' of the participants, it is necessary to become immersed very quickly during the interview into

the world of the participant and the expression of that world through language. However, in the focus groups this is less so as the communication between the participants needs to be already moderated by each of the participants themselves to ensure that the other members of the focus group coming into it with different experiences and from different departments, would understand. However, when the focus shifts to data analysis, the researcher needs to take a more etic approach and create a distance between the individual participant's expression and the more generalised language appropriate for social science. All research choices are highlighted on Figure 3.3.

3.9   Validity of research

To be able to discuss the issue of validity and the threats to it, it is necessary first to discuss the issue of what is true. Robson (2002) states that validity of research is to do with research being *"accurate, or correct, or true" (*p. 170). Reason and Rowan (1981) assert that the purpose of research is to check the ideas against the 'reality'. This is where the reasoning and the view of what reality is comes into play. Reason and Rowan discuss the nature of reality having to be developed away from the purely objective, outside and discoverable, and subjective, internal and indescribable. They cite Schwartz and Oglivy (p. 241) and propose the use of the notion of perspective, which can help in moving away from the notions of purely objective or subjective reality.

Maxwell (1992) also addresses the nature of truth and reality in his work. Through the lens of critical realism he assumes that there is no direct knowledge of the objective account – reality, to which we can compare the 'subjective' accounts. The validity of an account then cannot be established by comparing it to the truth or reality, and this comparison is known as correspondence theory. The concept of validity is applicable if it does not depend entirely on the features of the account, but if there is a way of assessing the account which relates to the things the account claims to be about. This concept of validity is then seen as a means of creating proof about the relationship between the account and what the account is about. He also claims that validity is not about the method but is relevant to the data, the account or reached conclusions.

Maxwell (1992) bases the categories of validity on the types of understanding that researchers' accounts incorporate. He argues for five categories of validity:

- Descriptive – that of what the researcher has seen or of the things that can be observed in principle but are inferred from other data.

- Interpretive – the accuracy of the participants' concepts as applied to the perspective of the individuals included in the account. This type of validity is about understanding what the objects, events and behaviours mean to the participants who are engaged with them.

- Theoretical – that of account as a theory of a phenomenon. The theory is seen to have two components: the building blocks of the model and the relationships between these building blocks. The theoretical validity then addresses both of the components, the validity of the concepts applied to the phenomenon - the building blocks, and the relationships between the concepts.

- Generalisability – that which allows the account of a specific person/s or situation to be applicable to person/s, times and settings. Two types can be observed: internal and external generalisability. Internal generalisability refers to applying the account based on specific persons within the same community, group or institution to other persons, times or settings that were not directly involved or observed. External generalisability refers to applying the account to other communities, groups or institutions.

- Evaluative – this involves the application of an evaluative framework onto the objects of study. Similarly to external generalisability, this type of validity is not seen by Maxwell to be central to qualitative research.

Threats to validity need to be addressed on these levels. Measures that can be taken to maximise the trustworthiness of research are by making it transparent, i.e. so that it can be clearly seen where the interpretations come from; by demonstrating parallel meanings across the data set, i.e. not being data-selective to one time period or one interview, but including all the data; and by using multiple coding, so that either the researcher utilising different methods arrives at the same conclusions, or so that different researchers coding the data arrive at the same conclusions (Johnson and Harris, 2002). In addition to this, the authenticity of the data interpretation helps to build trustworthiness in research. Measures taken to maximise the trustworthiness of this research are presented in Chapter 4 and Chapter 6 where the data analysis method and the data itself were made transparent, and Sections 4.2.6, 5.4 and 6.4.

3.10   Criteria for contribution to knowledge

Contribution to knowledge can be threefold. First, contribution can be contribution to theory, either in the form of developing a new theory or extending a theory already in existence by applying it on the phenomena of interest where it has not been applied before. Second, it can be contribution to the development of the research method, by developing new format for data collection, a way for data classification or analysis. Third, it can be contribution in the way of findings, by eliciting particular phenomena of interest in greater depth than what is already known about them.

This thesis contributes to knowledge primarily in the area of developing the method for data collection and analysis, and by the findings themselves. This is evident in the research questions in Section 1.3. However, the thesis develops a framework for communication processes occurring during the implementation of an enterprise system. Although the author does not claim this to be a definitive and exhaustive taxonomy of phenomena, it presents a creation of a theory per se albeit on a small scale. Chapter 4 focuses on further explanation of the contribution to knowledge in the area of research method.

4 DATA COLLECTION AND ANALYSIS METHOD

The data collection and data analysis methods used in this research are presented below. The first part of the chapter refers to the scoping stage while the second part refers to the study of communication issues. The objective of this chapter is to make the tools used in this research transparent, in order to enable other researchers to repeat the study. In parallel, the purpose is to show the development of the tools and the decisions made to improve the tools towards answering the research questions more fully. The chapter bridges the methods available and chosen to conduct this research on a theoretical level (Chapter 3) and the presentation of the data and the findings as a result of the use of data collection and analysis method (Chapter 5) and provides practical way of gathering and analysing data. The structure of the sections follows the same pattern, e.g. Section 4.1.1: the initial sub-sections relate to data collection activities, e.g. 4.1.1.1, 4.1.1.2, and 4.1.1.3; sub-section 4.1.1.4 relates to both data collection and data analysis by the means of cause-event-action-outcome map; while the last section refers to the tool used for data analysis – the reference framework, e.g. 4.1.1.5.

On a practical level, it is important for a researcher to bear in mind the access to companies when conducting case studies. When there was no established contact between the chosen company and the university, considerable time was spent in paving the path to access the people on the project and to develop trust towards further data collection activities, as well as identifying what the companies involved might benefit from if they took part in this research.

4.1 Data collection and data analysis for scoping the processes during enterprise system implementation

4.1.1 Case studies

4.1.1.1 Case selection

Several criteria were set in order to select the cases that were approached. These were:

- the location of the company - UK, for the reasons of access,

- the company size - large, over 250 employees, due to the fact that in large companies the complexity of implementation project is expected to be greater than that of a project in smaller companies,

- the market segment - manufacturing, which was seen as preferable primarily because in manufacturing companies the complexity of the implementation is expected to be greater,

- the system type - enterprise system,

- the timing of the researcher access - before or after going live, preferably while the implementation was ongoing, due to the retrospective nature of inquiry and the problems expected in participants' recalling past events,

- previous contact with the company, which was expected to facilitate access and gaining trust.

4.1.1.2 Structuring the time spent in the company

The case study protocol was used in order to standardise the approach to data collection (Appendix A). Demographic questionnaire was used in order to compile demographic data about the company and the details about the project (Appendix B). Interviews were the main technique to collect data. Two focus groups were used in addition, as well as documentary project evidence and company website.

4.1.1.3 People selection criteria

Companies have limited time and human resources and this is particularly so at times of high pressure, such as during ES implementation. Based on research objectives, certain employees in specific positions were identified to be very important as participants of the research. The necessary participants include:

- Project Manager, business implementation – to obtain project details and context information and details about the system in relation to the business,

- Key user – as they would be responsible for delivery of the system on the more local, departmental level and would have an understanding of the impact on end users,

- End user – to gauge their perceptions about the project and system and knowledge about the changes,

- Senior stakeholder – project sponsor – to understand the overall reasons for the project and its expected benefits,

- IT specialist/ Consultant – to understand the technical side of the implementation and their relationship with the key users during the system development,

- Project Manager, technical implementation – to obtain project details and context information and details about the system in relation to the existing systems, and

- Change Manager – to understand how the transition phase is managed in terms of human resources.

4.1.1.4 Cause-Event-Action-Outcome pattern

The pattern of Cause-Event-Action-Outcome has been adapted from the historic and diagnostic maps used by Lanzara and Mathiassen (1985). The authors use the maps to study implementation of an IT system (see Section 2.1.3).
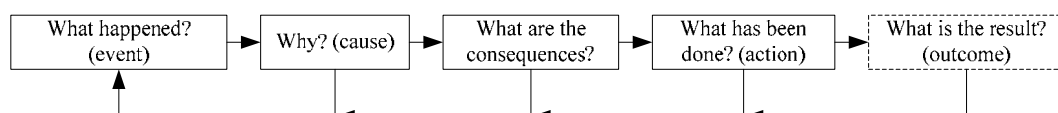
Figure 4.1: Basic pattern of a diagnostic map with outcome (adapted from Lanzara and Mathiassen, 1985)

These maps were used in this research to identify and analyse the relationships between the events during the implementation process. The outcome was added to the original map developed by Lanzara and Mathiassen in order to improve the understanding of the process and what was achieved by the action. An issue which affects an implementation process was defined as a chain of events, activities or states, comprising:

- one or more causes for an event or state that occurs during the implementation process,

- the event or state itself,

- an action or actions taken to follow on the event,

- an outcome or outcomes of the actions taken.

This pattern was used both for data collection during the interviews, and for analysing the data based on the causes.
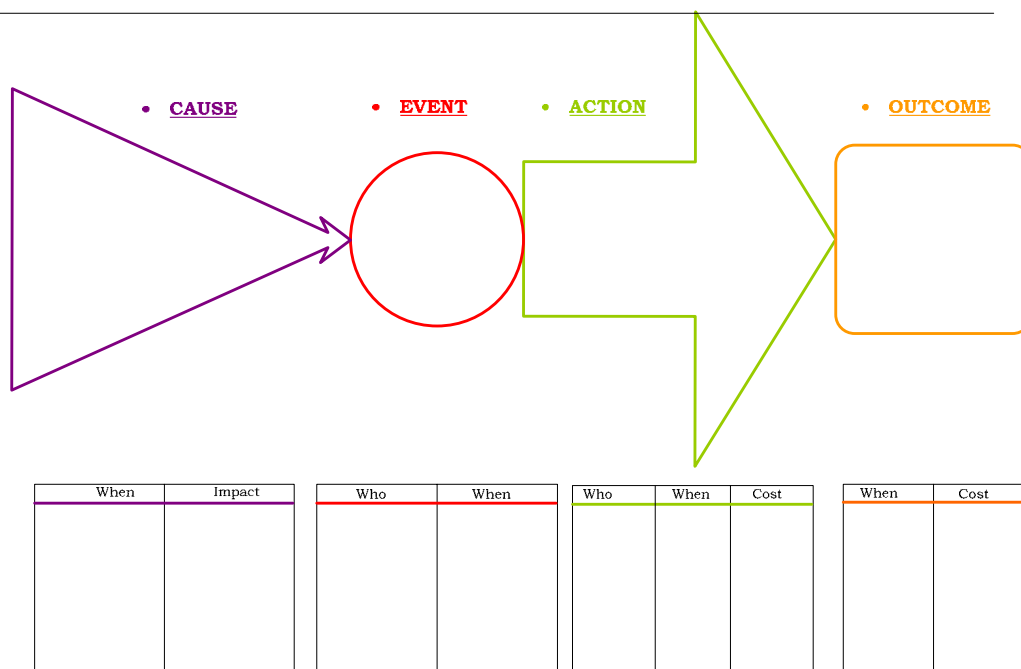
Figure 4.2: The C-E-A-O chart used for data collection in case study

 Figure 4.2 shows the chart that was used at the interviews and was given to the interviewees to fill in. The same type of chart was used for a focus group, however the responsibility for the decision process as to how to fill it in was passed over to the group (see Section 5.2.3).

4.1.1.5 Reference framework

A reference framework was used in order to classify the data and to help with understanding the processes that affect the enterprise system implementation project. During this research the framework went through stages of development, from the initial emerging framework which was used for literature analysis (Section 5.3.1.2), the second version (Appendix C) originating from the Process-based Model of Organisations (Section 2.1.4.1) and the final version (Appendix D)[7]. The difference between the second and the final versions of the framework is in the number of the categories on the two axes. The reason for changing the number of the categories on the two axes was that it transpired that the categorisation of the issues was inconsistent. The reason for this was that some of the categories were either too similar to differentiate, or that some activities and processes, e.g. change management and communication, were running continuously during the project.

The final version of the framework comprises three points of view and six categories. The points of view within the framework are project management [PM], business [B], and enterprise system [ES]. They describe the standpoint from which an implementation process can be looked at. In the final version of the framework, the categories are: strategy and goals, management, structure, process, knowledge, skills and resources, and social dynamics (Appendix D).

Reference framework – points of view

The points of view within the reference framework are: project management, business and enterprise system. Each point of view looks at different subprocesses within the implementation process, and these are described below.

- Project management of the implementation process includes activities related to planning and monitoring of the implementation according to the time and budget, creating and managing a project team, their skills and knowledge, and other necessary resources, creating and executing the project management strategy, etc.

- The processes within the permanent business – organisation, in which the system is implemented, include business strategy and goals, the organisational hierarchy and departmental structure, business processes, existing knowledge and skills, organisational culture, business resources in terms of people, finance and time available for implementation of the system.

- The processes related to the new enterprise system include all activities towards the development or customisation of the system, e.g. relating to its functionality, architecture, interfaces with other systems in the organisation, data.

Reference framework – aspects

The aspects of the reference framework are: strategy and goals, management, structure, process, knowledge, skills and resources and social dynamics. They are described below.

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[7] The work on framework development was done by the BEST project team as numerous case studies were analysed.

- Strategy and goals aspect refers to the activities and processes to achieve the goals of the project, the business and the enterprise system and the activities related to the ways in which to achieve them.

- Management aspect relates to the activities and processes towards realisation of the strategy and goals for the PM, B or ES.

- Structure aspect refers to the formal relationships, such as team structure from PM point of view, hierarchy and organisational structure within the business, and the structure of the enterprise system from the ES point of view.

- Process aspect directly refers to the activities that relate to the running of the PM, B or ES.

- Knowledge and skills, and resources includes the knowledge and skills that the employees need in order to perform the activities within the business, the project or related to the enterprise system; and the resources available for performing the activities.

- Social dynamics as aspect refers to activities and processes related to leadership, commitment, motivation, culture, power, politics.

The categories represent different facets of project management, within the business and of an enterprise system. For example, the management from the project management point of view would include the project management style, while from the business point of view the management within the business in relation to the project, and from the enterprise system point of view would include how the enterprise system itself is managed. Social dynamics, as another example, includes leadership, commitment, awareness, attitude, power and political behaviour within the project team, within the business or in relation to the enterprise system.

The reference framework provides an analytical view of the processes related to enterprise system implementation. Additionally, it is used to categorise the issues identified in the case studies and in literature and helps in practical disentanglement of the complex implementation process.

4.1.2 Literature analysis

4.1.2.1 Literature selection

During the study of the literature available within the area of enterprise system implementation, the selection criteria emerged, and more than 120 articles and books were assessed for suitability for this study. During the initial stage of the literature search, electronic databases were used, namely EBSCO, Emerald, Science Direct and ProQuest. Finally, literature sources were divided into three groups:

- Academic case study articles and books,

- Non-case study literature - books, academic articles, and web resources, and

- Practitioner case study articles.

The criteria for selecting the articles within the first group were threefold. First, the articles needed to be peer reviewed, more than 4-5 pages long and appearing in a

professional journal. Some databases, e.g. ProQuest, distinguish between the academic and the practitioner articles so from the search results only the preferred type can be selected. Second, the article needed to have a case study, rather than be theoretical or have quantitative analysis within a case. This was also used as a search criterion and confirmed during the initial scanning through the article. Some databases, e.g. Emerald, have as search criteria the type of the article that could be searched; case study is one of the types. Third, the article needed to concentrate on enterprise system implementation, either in part or wholly. Some articles presented cases of business process re-engineering alongside an implementation of a system, or two different systems, e.g. knowledge management and enterprise system. This was also used as search criteria and confirmed during the scanning of the article. In addition to this, a chapter from a book presenting a case was included in this group. Nine articles and one book chapter were selected and they covered the implementation of a system either in manufacturing companies [5], a service industry [1], a combination of the two [1], the oil industry [1], a government institution [1], and a hospital [1]. One of the articles was related to an SME. In terms of the geographical distribution, the organisations covered in the articles were either in Europe [2], the Middle East [1], South-East Asia [2], Australia [1] and South America [2], or were international [2]. The articles were published between 1993 and 2003.

For the non-case study literature, the books and articles used for the literature review closer to change management were used for literature analysis. They were rich in examples and patterns, but these were generalised and, compared with the literature on case studies above, were less detailed. The context of the cases was not always present.

The third group comprised of the practitioner articles. These were not peer-reviewed and were generally published in frequently published professional magazines. They usually concentrated on the benefits of a system, but seemed to lack critical assessment. Only a few articles of this type were analysed. The organisations covered were a hospital [1], a manufacturing company [1] and a pharmaceutical company [1] with geographical distribution in North America [2] or internationally [1]. The articles were published between 1997 and 2003.

The main literature selection criterion was that there was enough richness in the paper to extract implementation lessons. An attempt was made to cover different geographical areas and different types of organisation, particularly within the case study type literature. However, insufficient articles were available to compare the issues which affect the implementation in different industries or regions. Of most interest were the comparisons of issues reported in different types of literature, as well as the actual quality of the issues reported.

4.1.2.2 Cause-Event-Action-Outcome pattern and reference framework

Both of these concepts, the CEAO and the framework were used in literature analysis in the same way as during the case studies described above in Sections 4.1.1.4 and 4.1.1.5. The only difference in the use of the CEAO pattern was that in most cases from literature the pattern itself did not have all the elements of the chain, e.g. there might be only a cause, an event and a final outcome or an event and a remedial action to follow it. These chains however were also included in literature analysis as it was deemed that

their inclusion would be beneficial towards increasing the understanding of the implementation process.

4.2   Data collection and data analysis for communication issues

4.2.1   Case selection, structuring the time spent in the company and people selection criteria

In terms of the criteria used for case selection, these corresponded to those used in the first case study. However, considering that based on the findings from the scoping phase, communication issues became the focus of further research, as well as the reduction of number of large companies implementing enterprise systems, it was deemed beneficial to open up the research choices to include small and medium enterprises [SME]. Two companies took part, one an SME and the other a large company.

Demographic questionnaires were administered to gauge demographic organisational and project data in the same way as in the scoping study (Appendix B). The structure used during the interviews is depicted in Appendix E, on an example of an end user. In addition to interviews as the main data collection technique, a workshop was used to collect and validate the findings from interviews in the second case study. Company websites were used for more information. In case of the large company, available company literature was used, as well as project documentation.

People selection criteria remained the same.

4.2.2   Interview structure development

The structure of the interview was developed in two stages. It involved conducting a study in an SME, an expert interview and study in a large company. During the first study of the second phase of research, the interviewees were asked specific questions about the communication events or states during the implementation of the system. This was done in a very similar way to how the participants in the previous study were asked about events or states that influenced the implementation process. This approach was found not to be beneficial for the reasons stated in Section 4.2.4. Additionally, they were asked to assess how the specific event facilitated or hindered the implementation in terms of the transfer of ownership from the management to the users, employee loyalty, and reducing anxiety about the changes.

The necessity to achieve fast data collection and analysis resulted in developing an interview layout which would primarily simplify the method of data recording.

The new interview structure and a set of questions were developed based on the experience during the SME study. The interview would start with the questions about the background information about the employee, their educational background, time with the company and involvement on the project. The next stage would be the use of a SWOT chart for communication successes, weaknesses, threats and opportunities. The SWOT approach is addressed in more detail in Section 4.2.3. A SWOT chart was deemed to be a useful structure providing enough grounds for the interviewee to elaborate on communication processes and states during the implementation. Then, the focus would shift to the communication success and barrier in the form of C-E-A-O in a similar format as was used during the SME case study (Section 4.2.4). Finally the last

phase of the interview included the questions relating to commitment, transfer of ownership, and concerns about change.

This interview layout and length were tested prior to going to the case study company. The interview was with an expert who used to be an enterprise package expert and worked in a consultancy. This is addressed in more detail in Section 4.2.6. Overall, the questions provided suitable data addressing the desired issues.

4.2.3   The use of SWOT analysis

Strengths, weaknesses, opportunities and threats analysis has its origins in the field of business strategy in the 1960s where it was used to elicit ways to align an organisation and its environment and make the alignment profitable (Valentin, 2001; Dyson, 2004). However, with the development of other tools in this field providing more advanced levels of analysis, it is now seen as a rather simplistic one (Panagiotou, 2003). In the case of this research, the SWOT analysis is used more loosely as a means of data collection and eliciting the 'story' about the communication within implementation projects. As such, it is mainly referred to as the SWOT chart, considering that it does not involve an analysis, but rather a chart used in order to collect the data. Figure 4.3 shows the chart used at interviews.

STRENGTHS	WEAKNESSES
THREATS	OPPORTUNITIES
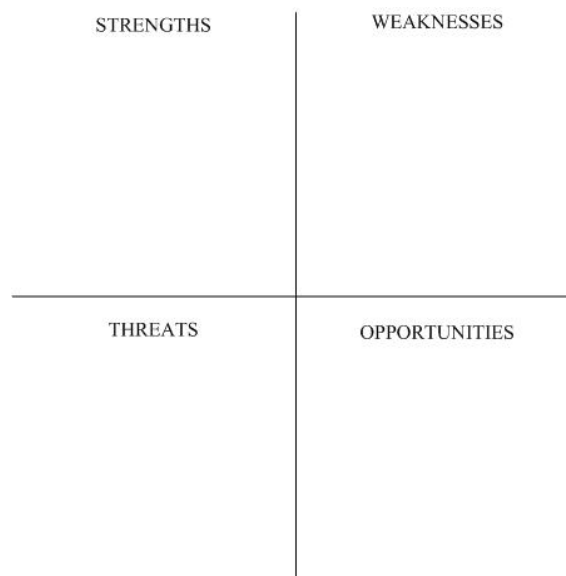
Figure 4.3: The SWOT chart

4.2.4   Adapted Cause-Event-Action-Outcome pattern

Following the interviews in the SME study it transpired that the interview structure needed to be revised. The wording of questions during the interviews was of particular importance as it seemed to limit the openness of the participants to look at the breadth of the processes that could be taken into account and selected as examples. The participants were asked to think of a specific communication event or state that affected the implementation process. This resulted in most of them choosing a specific event rather than a process as one of the communication events. Examples are training, an

announcement and a meeting. This type of response is narrowly related to one event of more technical information exchange and does not explore the depth of communication processes between the employees during the implementation of the system.

For this reason, in the second case study, the questions asked relating to communication C-E-A-O were phrased differently and focused on communication success or communication barriers. It was expected that this would encourage the participants to think in broader terms of processes, rather than only specific events. Additionally the word 'event' was replaced by 'success' or 'barrier' in the chart. Figure 4.4 shows the new chart used in the second case study.
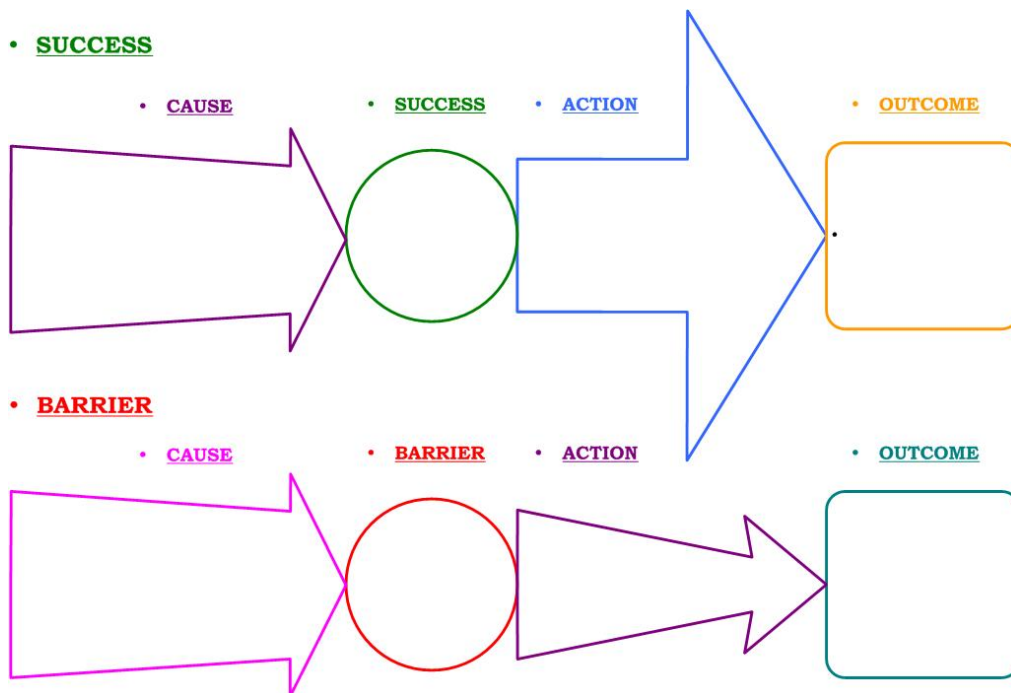
Figure 4.4: The C-E-A-O communication success and barrier chart

4.2.5 Commitment, transfer of ownership and employee concerns: question development

In the SME study, the final three questions relating to each of the communication events raised concerned ownership, loyalty and anxiety about change. Each of the events was assessed by the interviewee depending on how it supported or hindered the implementation process in terms of the ownership transfer from the management to the users, employee loyalty, and the reduction of anxiety about the changes to come. However, when asked about the interview structure, some interviewees commented that the questions were overly cumbersome and complicated to understand. They also had concerns that other interviewees in lower positions would not understand them.

For these reasons, the questions regarding ownership, loyalty and anxiety about the change were rephrased and simplified. Additionally the terms previously used were replaced by ownership, commitment and concerns about change, as they were deemed

more neutral and less loaded. The last part of the interview in the second case study comprised questions about commitment, concerns about organisational and job changes, and about the issues of the ownership of the system. The questions relating to commitment attempted:

- to gauge the interviewee's perception about how the system would provide support to the company and individuals' day-to-day work,

- to gauge the extent to which the system was seen to make the company and individuals' work more difficult,

- to identify any events that increased or decreased the interviewee's commitment to the company and the project.

The questions about the employees' concerns due to expected organisational and job changes were aimed at:

- identifying the changes on both the organisational and the individual level,

- employees voicing their concerns about the changes,

- identifying any issues that they might need to know about to be more comfortable with the changes.

Finally, the questions relating to the ownership aimed to establish the interviewee's awareness of, and differentiate between:

- the responsibility for the execution of the project phases,

- responsibility for the system,

- responsibility for the system development.

4.2.6   Expert interview as a means of interview structure validation

The interview with the enterprise package expert was conducted in order to test the interview structure and timing. The interview took 1h15min and the pace of the interview was changeable. The first section, which focused on demographic data, took a relatively long time compared to the second section. This was unexpected and highlighted the need for more guidance during that stage of the interview. The expert was relatively open as the interview was not taped. Additionally, there was a significant time distance from the project in which she was involved - 4 years. However, during the interview, the expert started increasingly remembering the details of the project and the communication problems she faced. The new structure and the questions were deemed as acceptable.

4.2.7   Workshop as a means of further data collection and validation

Once the data was collected and analysed, the findings were presented to the members of the project management and business implementation team in the second case study in a workshop format. These participants were not involved in one-to-one interviews. The participants discussed the findings and the actions that could be taken to minimise the threats and weaknesses highlighted by the SWOT chart. This opportunity was used by the author to validate her understanding of the project as well as to add more depth by including the different perspectives of the workshop participants.

The workshop provided a way of establishing communication between the interviewees with different levels of project involvement, and with the project management and business implementation team indirectly through the research findings. This opportunity also enabled greater communication and understanding between the workshop participants. The analysis of the points in the SWOT chart enabled the participants to move the project forward. Another meeting was scheduled at the workshop with the purpose of devising actions to address these points.

4.3   Conclusion

In summary, the previous sections presented details of the data collection methods used in this research. These methods were used in order to achieve research objective VI relating to the development of a method so that objectives IV and V can be achieved (Section 1.3.1). A question which naturally follows from this is concerned with what data was collected during the initial stages of their use and how they helped in answering research question 2 and 3. This is addressed in Chapter 5. Further data obtained by the use of the outlined methods on the study of communication processes is presented in Chapter 6.

5 SCOPING THE PROCESSES DURING IMPLEMENTATION OF ENTERPRISE SYSTEMS

The purpose of this chapter is to present research conducted in the scoping phase with the main focus on overall processes affecting the implementation of enterprise systems. The use of the tools for data collection and data analysis is explained in the company and literature context. This includes the Cause-Event-Action-Outcome pattern, which was further adapted for the second phase of research (Chapter 6), and the reference framework used for data classification in the scoping phase, for the analysis of both the case data and the literature data. The case study results, literature analysis results and expert validation are presented. This is towards fulfilling the research objective II. The final section on emerging issues from the scoping phase is towards the fulfilment of objective III.

5.1 Case study – Furco

5.1.1 Case selection

This company was chosen to be approached for a case study, based on several main criteria set by the research objectives:

- the location of the company - England,
- the company size – large, over 250 employees,
- the market segment - manufacturing,
- the system type – off-the-shelf system, Baan,
- the timing of the researcher access - after going live, and
- previous contact with the company.

It was hoped that the research conducted in the company would provide the company with insight into the events which were successes or failures during the implementation process, and further learning from that.

5.1.2 Case background

The company, Furco, was selected to be the first case study within Phase 1 of the research. The company is a subsidiary of an international company with over 300 employees. Initially, the company was owned by The Group – a pan-European collective of designers and manufacturers. The Group was one of Europe's largest concerns in the specified market niche.

Furco was founded in 1952 and was a consistently profitable organisation, with an annual turnover of £26 million, as reported on the internet, although the value given by the Project Manager in the demographic questionnaire was £10 million.

The Group is a family owned business, which takes the group approach to manufacturing. The company is a collection of European manufacturers within the same field, with operations in Denmark, Germany and the Netherlands. A Danish holding company, The Holding, owns The Group. There was an attempt to sell The Group within the field to another company in 2001. However, this attempt failed as the

parties could not agree on a price. So The Holding again considered releasing The Group after several years of losses.

The website of the consultants involved in the implementation quotes the Managing Director, who says that the objective of the implementation was to create a business that surpasses its competition in customer service, while building integrity with the customers. He also recognised that there was a severe decline in the market and conservatism to change within Furco. In the demographic questionnaire, the reason for the implementation is that the enterprise system was necessary for competition and that it was The Group's decision, in order for all sites to have the same system.

Furco did not create the success criteria in terms of SMART objectives – specific, measurable, achievable, relevant and time bound. However, the anticipated benefits stated by the Project Manager in the demographic questionnaire were reduced effort, reduced time, improved customer service, greater agility and stock reduction. Other effects of the implementation of the system include changes in business processes: sales order processing, planning, production, purchasing, and demand is now calculated and serviced differently. In addition, the system increased collaboration and social contact, and end user responsibilities.

5.1.3   Data collection and data analysis phase

This author visited the company on two occasions. The first visit included the presentation of the project and the introduction of the researcher to the Project Manager, discussion about the suitability of the ES implementation project for the purposes of the study, and establishing the initial face-to-face contact. During the second visit, the demographic questionnaire was completed. At this time it was planned to arrange further visits in order to conduct one-to-one interviews and focus groups.

However, between the visits the company situation changed. In 2003, Furco merged with another company within the same area of manufacturing. The Project Manager expressed concerns about his own position in the company and the willingness and interest of the new management to take part in research. No further contact ensued.

5.2   Case study - Durco

5.2.1   Case selection

The company was chosen to be approached for a case study, as it satisfied several main criteria set by the research objectives:

- the location of the company - England,
- the company size – large, over 250 employees,
- the market segment - manufacturing,
- the system type – off-the-shelf system, SAP,
- the timing of the researcher access - several weeks before going live, and
- previous contact with the company.

Most importantly, it was hoped that the research conducted in the company would provide the company with insight into further improvements that could be made with

regard to the implementation process. From this point of view, the use of the research conducted is twofold: on an individual level, and on the organisational level. As the interviews are conducted, the employees are encouraged to reflect on the implementation process more than they would otherwise. This provides an opportunity for the employees to look deeper into which actions and events helped or hindered the process. This in turn provides an opportunity for them to change their own actions, as well as an awareness of the things that can be improved at the organisational level. At the organisational level, it is hoped that this research provides the company management with an insight into the actions that are helping or hindering the implementation process, as perceived by the employees.

The company background details have been collated from the company web-sites, project related literature and the demographic questionnaire which was administered to the Project Manager.

5.2.2 Case background

The company, Durco, was selected for the first case study within the scoping phase of this research. It is a durables manufacturer, supplying organisations of different sizes and types, from start-up companies to established institutions. The site which took part in this study is located in England, where it began operating in the 1920s. This is also where the European headquarters are located. Durco is a Fortune 500 company, with revenues of $4.4 billion. It has two million customers globally in over 120 countries.

The SAP system was strategically selected to support the 'back office' activity in 1996 by the Europe, Africa and the Middle East division of the company. Consequently, the system was implemented into all operating companies in Europe. The first implementation was in 1997 in Germany, followed by the UK and Republic of Ireland, Sweden, France, Austria, and Finland. The system was also implemented in companies which were acquired in Durco's expansion in order to support their operations and assist them in integrating into Durco.

Durco's manufacturing function had been supported by different versions of a legacy system [MK8] since 1993. The introduction of the SAP system in the manufacturing function had been considered previously, but was always out of scope. It had been implemented in North America to support manufacturing operations.

It had been recognised that there was a lack of system integration of the manufacturing processes with the sales and logistics functions. This was considered to be a restriction. As there were more configure to order [CTO] processes and procurement and planning processes on a global level, it became necessary to have a common system platform.

The details of the project, including the objectives, were announced to the employees in August 2002. The objectives were stated to be: to develop and implement a global CTO process; to provide integration between the SAP and the existing systems and processes in order to support the logistics supply chain; to align business processes to common company solutions under SAP, reflecting the existing solutions for North America; to extend the current SAP functionality to support processes operating on the legacy

systems; and to complete the transfer of processes and data onto SAP by the end of January 2004[8].

The reasons for the implementation of the system stated in the demographic questionnaire were planned benefits, because it was dictated by the holding company, and integration of all companies operating in Europe on one system.

5.2.3 Data collection and data analysis phase

The data collection stage took place between 28 November 2003 and 19 January 2004. After administering the demographic questionnaire and observing a bi-weekly change management meeting, six one-to-one interviews and two focus groups with six participants each were conducted in order to collect the data. The interviews lasted between 45 minutes and two and a half hours, and the focus groups one to one and a half hours.

In order to comply with the case study protocol, specific themes were followed during the interviews and focus groups. The interviews and the focus groups were semi-structured.
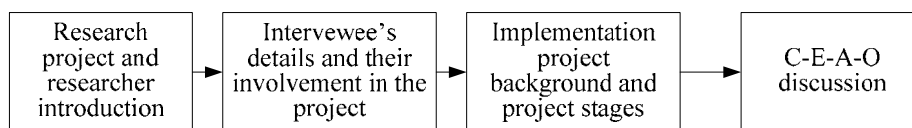
Figure 5.1: The interview stages

The interviews followed a four staged process (Figure 5.1). The stages were as follows:

1. Introduction to the research project and the interviewer,

2. Introduction by the interviewee and explanation of their involvement in the implementation project,

3. General conversation about the project and the project stages as perceived by the interviewee, and

4. Focus on the chain/s of events, activities or states which affected the implementation process in terms of the cause-event-action-outcome chain.

In the case of the interviews, the interviewee had enough time to present the project phases, the three issues they thought were important or had the highest impact, and to go into more detail about the issues. The details involved thinking and writing down the causes for a particular event or state, the actions taken as a follow-up, and the outcomes.

Focus groups were conducted in a slightly different way from the interviews, and followed a seven stage process (Figure 5.2).

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[8] Project launch company presentation.

| Research project and researcher introduction | → | Focus group participants' details and their involvement in the project | → | Implementation project background and project stages | → | Brainstorm of issues affecting implementation process | → | Grouping of issues and selecting a group heading | → | Allocating points to select the most important group | → | C-E-A-O discussion |
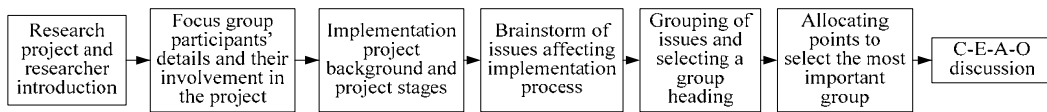
Figure 5.2: The focus group stages

The stages were as follows:

1. Introduction about the research project and the interviewer,

2. Introduction by the focus group participants and explanation of their involvement in the implementation project,

3. General conversation about the project and the project stages as perceived by the participants,

4. Brainstorming of the issues affecting the implementation process by participants individually and a brief presentation of the issues,

5. Grouping of the issues and labelling,

6. Allocation of points to groups by each of the participants where each participant had three points to allocate in whichever way they chose, and selection of the main issue based on the number of points, and

7. Focus on the chain of events, activities or states which affected the implementation process in terms of cause-event-action-outcome chain.

As the discussion and reaching agreement regarding the project phases took a considerable amount of time during the first focus group, this stage was skipped during the second focus group. Additionally, the first focus group was more flexible regarding the finishing time, while the second focus group had a time constraint of the participants and the room availability. Both focus groups had difficulties in completing the action and outcome part of the interview, due to time constraints. However, for reasons of understanding the issues better, the actions and outcomes for the selected issue were forwarded at a later date by one of the participants from the first group. Although it is recognised that this data might be biased, it was helpful to understand how the events were followed up.

During the interviews and the focus groups, a chart was used to collect all relevant pieces of information. Figure 5.3 shows a map of the events as an example.

Issue 2: Communication feedback loops - some staff felt left out of important decisions which affected them - we set up more communication sessions to meet their needs

When	Impact
• Stage 2	Concern in extended team
	• Poorer information for the process mapping
• Impact factor 4	• Alienated extended team from the creation process

Who	When
• X	• Stage 2

Who	When	Cost
1.W team	Stage 2	1hr for 12 people
2.X		1hr@£10ph + 4 people@ 15min
3.Y&Z		1 morning = 3hrsx25 people

When	Cost
Stage 2	Save time and concern later
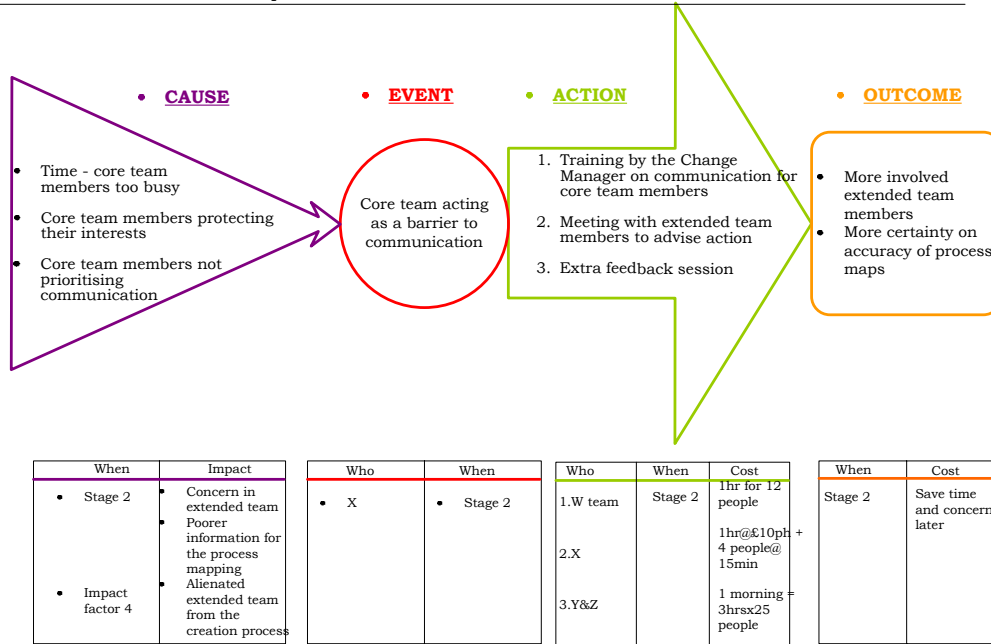
Figure 5.3: A chart used for data collection[9]

All the data collected was associated with a particular issue which the interviewee/s identified as important to the implementation process. The interviewees were also asked to focus on one positive event which contributed to the smoother implementation process.

An event chosen by the interviewee could have been caused by an action of an actor or by a condition perceived as a cause of the event. The specific chosen event may have led to further action, but could also be chosen as a cause of another event.

Data analysis was conducted for the company and presented in the company report. However, the members of the project management team were going through a particularly busy time during the implementation when the report was completed. The presentation of the research findings was lower in priority and consequently, this author did not have an opportunity to report the findings back to the company. However, further contact ensued approximately one year after the data collection. The Project Manager reported that the implementation was a success, that it had *"flattering internal audit comments"* and has been claimed as a company's *"model IT project"* in terms of project management.

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[9] Names concealed for confidentiality.

5.2.4   Case data analysis

A total of 46 C-E-A-O chains was collected, some of which are based around the same event, but with different causes. The classification was conducted according to the causes. By identifying the causes it was hoped that the situations that needed attention could be identified in order to prevent an unintended, unexpected or unwanted event from occurring.

Category \ Dimension	Project manage-ment	Business	Enter-prise system	Total
Strategy and goals	0	1	0	**1**
Management	6	3	0	**9**
Structure	0	5	1	**6**
Process	3	5	1	**9**
Knowledge, skills and resources	6	6	0	**12**
Social dynamics	1	8	0	**9**
Total	**16**	**28**	**2**	**46**

Table 3: The distribution of CEAO chains within the framework

Table 3 presents the distribution of the C-E-A-O chains within the reference framework. By far the highest number of issues is within the business dimension. Within the categories, knowledge, skills and resources have been populated with the highest number of C-E-A-O chains, followed by management, process and social dynamics, with equal numbers of chains. The enterprise system dimension has the lowest number of chains, and the strategy and goals category has the lowest number of chains. The single most highly populated cell is business/social dynamics.

Table 4 summarises the types of issues within each of the cells of the reference framework, in which the summary of the issues is presented. Considering that the classification was made according to the cause, in most cases, the clarification of the event is also presented.

	Project Management	Business	Enterprise System
	Category **[data from issues]**	**Category** **[data from issues]**	**Category** **[data from issues]**
Strategy & goals	x	Long term business plan unknown resulting in job insecurity	x
Management	Lack of communication affecting job security, lack of decisions (including the ones on alternate solutions available) resulting in lack of communication, false starts affecting job security, core team members not prioritising communication and acting as a communication barrier	Recognition of the importance of the project by the business resulting in people giving more time to the project, project funding delay resulting in serious constraints on the project timing, lack of decision about the future organisational structure	x
Structure	x	Uncertain organisational structure resulting in career concerns and affecting job satisfaction, making people feel uneasy that they don't understand it, job duplication affecting job security, expected staff reduction affecting communication	Designing for every possibility, making design of the system too complex
Process	Review sessions, good project monitoring, a lot of debating about each issue for the to-be processes	Current business process different from the one available in the new system, change perceived as being too fast affecting the job security, other changes affecting job security (outsourcing), change affecting the communication	Planning process becomes one as there is only one IT system, resulting in two planning departments having to merge
Knowledge & skills, resources	Sufficient resources of manpower and sufficient expertise resulting in keeping to plan, previous project experience, giving the right mix of consultants and internal employees, lack of time affecting communication, lack of knowledge about business processes within the core team, lack of understanding about who has decision making authority, resulting in slow decision making process	Change in the volume of work within the Rapid Processing Unit, increased understanding of business requirements resulting in problems with time and cost, lack of knowledge about who has the information and who should communicate, lack of understanding if things are known and not told, or are not known, not understanding the changes	x
Social dynamics	Core team members protecting their interests and acting as a communication barrier	Senior management unable to agree on who controls the planning area, making people feel uneasy about not knowing the organisation structure, the feeling of being a 'forgotten army', the fear of change, the company history, equating change with redundancy and integration with fewer people all affecting the job security, informal communication and rumours affecting job security and trust in the middle management decisions if not approved by the top management	x

Table 4: Issues classified according to the reference framework

5.2.4.1 Positive issues

Positive issues have been highlighted specifically in management from the business point of view and process and knowledge, skills and resources from the project management point of view. They point out the importance that the business, i.e. the employees, give to the project, good project monitoring and review sessions, sufficient resources and expertise within the project, as well as the use of experience from the previous project to achieve the right balance of skills within the team.

5.2.4.2 Negative issues

The negative issues seem to have prominent themes. These are:

- Decision making from the management side,

- Communication both from the top and middle management to the operational level and within the project team,

- Uncertainty about the future organisation hierarchy, and

- The fear of change and what it might bring.

Although many actions were conducted to address the lack of communication, there was still a very strongly expressed need for sufficient information to counterbalance the fear of change, and what the change might bring. However, all four themes are closely interlinked and affect each other significantly.

It is perceived that these issues might not have 'quick fixes'.

5.2.4.3 Cells with no data

The areas within the reference framework that are left without any data are:

- The strategy and goals and structure category from the project management point of view, and

- Strategy and goals, management, knowledge, skills and resources, and social dynamics from the enterprise system point of view.

Within the business point of view, all the cells were populated.

Strategy and goals from the project management perspective would include information strategy and the influence of the business on the project in terms of strategy, e.g. reducing the risks in contract management. Structure from the project management perspective covers the selection of the team and the communication structure within the team. From the ES point of view, a clear goal for the ES, technology standards, consultants' or vendor's competence, and vendor's flexibility, have not been addressed in the data.

The areas in which there are no data provide a reason to be further explored by the company. They might not have appeared in the data collection process for two reasons: either because they exist as positive or negative events, but are not considered to be significant by the participants, or because there was no awareness of them at the stage when the data was collected. In either case, these areas might need to be addressed by further research.

5.3 Literature analysis – using literature as a source of secondary data[10]

Literature has been used as a source of secondary data. The aim here was to explore ways to maximise the use of the existing literature on the implementation of enterprise systems. In addition to this, the aim was to use the existing literature in order to develop a better picture of the issues affecting the implementation, as well as to possibly identify the areas that would benefit from further research. This was towards achieving objective II, and partially objective III. After the changes to the first reference framework (Appendix C), issues from the literature have been classified into the final version of the reference framework presented in Appendix D. The literature was analysed using content analysis, which can be defined as a *"research method that uses a set of procedures to make valid inferences from text"* (Weber, cited in Neuendorf, 2002, p.10). The references of the papers which were analysed are presented in Appendix F.

5.3.1 Initial literature analysis

5.3.1.1 Initial pattern analysis process for the case study literature

The analysis process was split into several steps. The first step of identifying the articles involved a search on the topic of enterprise system implementation in various cases, e.g. Computer Integrated Manufacturing, Enterprise Resource Planning, SAP, etc., and of these articles, those with case study content were selected. At this stage of the research only the academic case study articles were selected. The next stage of selecting the causes, events, actions and outcomes from an article included marking or numbering the significant events or situations within the 'story' about the studied situation. In the third stage, the list of sentences containing these significant events and situations was created, using the cut and paste function. Following that, a sentence, or the summary of a sentence concentrating on the specific event or situation was put into a row within a table with others which were connected by time sequence, or which had a causal relationship. This could be done with reference to the original article to avoid confusion. In this way a C-E-A-O pattern was created.

For further analysis and grouping of the patterns, the reference numbers were allocated based on the article number and the sequential number of the issue in the table created. This numbering system made it easier to relate the issue back to the article if necessary. The following stage comprised the summarising of an issue or choosing the keywords with which to represent it, and noting them down on cards. This approach made it possible to see the bigger picture of the issues as they were expressed in a concise manner, and allowed the grouping of the issues to take place. Once the groups emerged, this structure could then be used on the issues in the initial tables, which could be rearranged accordingly (Figure 5.4).

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[10] The work on literature analysis has been presented in the paper by Sedmak, Fan and Wognum (2004).

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                    ┌─────────────────────────────┐
                    │  Identify case study articles│
                    └─────────────────────────────┘
                         │                    │
              ┌──────────────────┐   ┌──────────────────┐
             (     Article 1     )  (   Article 2 ….    )
              └──────────────────┘   └──────────────────┘
                      │                        │
        ┌─────────────────────────┐  ┌─────────────────────────┐
        │ Selecting causes (C),    │  │ Selecting causes (C),    │
        │ events (E), actions (A)  │  │ events (E), actions (A)  │
        │ and outcomes (O)         │  │ and outcomes (O)         │
        └─────────────────────────┘  └─────────────────────────┘
                      │                        │
        ┌─────────────────────────┐  ┌─────────────────────────┐
        │ Extracting the list of   │  │ Extracting the list of   │
        │ C, E, A and O's          │  │ C, E, A and O's          │
        └─────────────────────────┘  └─────────────────────────┘
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        ┌─────────────────────────┐  ┌─────────────────────────┐
        │ Linking the C, E, A and  │  │ Linking the C, E, A and  │
        │ O's into issues and      │  │ O's into issues and      │
        │ inputting them into a    │  │ inputting them into a    │
        │ table                    │  │ table                    │
        └─────────────────────────┘  └─────────────────────────┘
                      │                        │
        ┌─────────────────────────┐  ┌─────────────────────────┐
        │ Allocating the reference │  │ Allocating the reference │
        │ number for issues        │  │ number for issues        │
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        │ Extracting the gist or   │  │ Extracting the gist or   │
        │ the keywords for an issue│  │ the keywords for an issue│
        └─────────────────────────┘  └─────────────────────────┘
                      └───────────┬───────────┘
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                    │ Grouping similar topics  │
                    │ of issues                │
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                    ┌─────────────────────────┐
                    │ Merging and rearranging  │
                    │ the table of issues      │
                    │ according to groups      │
                    └─────────────────────────┘
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Figure 5.4: The stepped process of classifying the Cause-Event-Action-Outcome patterns into the emerging framework

5.3.1.2 Emerging classification framework

Following the process described above, the issues found in the case study literature were classified according to different categories. The categories that emerged are shown in Table 5 against the number of issues in each category.

Category	The number of issues classified in a category
Technical issues	16
Reasons, expectations and benefits for IT implementation	14
IT department, management and consultants' approach to implementation	13
Parallel work, end user perception	12
Culture and power, employment practices	10
Lack of communication/other priorities	8
Training	2
Total	75

Table 5: Classification framework which emerged from the literature

This classification was based on the whole issue rather than only cause or event. When reading every issue and summarising it onto a post-it note, the main theme was conveyed. The high number of technical issues that were addressed in the articles led to the conclusion that although the articles were case studies, the focus was still on the technical side of the implementation of an enterprise system. This group was followed by the group of issues on reasons, expectations and benefits of an ES implementation, and the group of those relating to the implementation approaches by either the management, the IT Department or the consultants. Surprisingly, training, which is very often thought of as crucial to the implementation process, was grouped in the lowest number of issues.

5.3.1.3 The use of the emerging classification framework in populating the reference framework

The emerging classification framework was used to populate the initial reference framework for classification of the issues from the literature. The initial reference framework is presented in the Appendix C. This allowed for the alignment to be made for all the concurrent processes of classification of issues coming from different sources - literature and case studies. However, in this case, the groups were too generic, and it was deemed better research practice to go back to the issues and classify them individually. The correspondence of the issues from the two frameworks is presented in Table 6.

Reference framework	Emerging classification framework from literature
Communication	Lack of communication/other priorities
Arrangement	Culture and power, employment practices
Knowledge and skills	No data
Culture	Culture and power, employment practices
People commitment	Parallel work, end user perception
Management	IT Department, management and consultants' approach to implementation
Process	Technical issues
People resources	No data
Strategy and goals	Reasons, expectations and benefits for IT implementation
Training	Training
Structure	Technical issues, IT Department, management and consultants' approach to implementation

Table 6: The comparison of the categories in the emerging classification framework with the categories in the reference framework

The table above shows how the categories that emerged from the issues found in the literature could compare with the categories within the reference framework (Appendix C). As some of the categories overlapped and different issues from the same category would come under different categories within the reference framework, the issues were studied again individually and sorted according to the reference framework.

5.3.2   Second stage of the pattern analysis process

 5.3.2.1 Academic case studies from the literature

In the second stage of the pattern analysis process, the analysis was conducted in a similar way for the new issues coming from the articles. The analysis process was split into several steps. The first step of identifying the articles involved a search for articles which focused on case studies. The next step was to select the causes, events, actions and outcomes from an article by marking or numbering the significant events or situations within the 'story' about the case. Following that, the list of sentences containing these significant events and situations was created. A sentence, or the summary of a sentence concentrating on the specific event or situation was then put into a table row with others which were connected either by time sequence or had a causal relationship. In this way a C-E-A-O pattern was created.

Following the creation of the tables, the new issues were joined together with the issues classified before, and re-classified into the final version of the reference framework (Appendix D) according to the cause and, in some cases, referring to the event, action and outcome, in order to understand the issue better. The reason for this classification

was to obtain the consistency and alignment between different type of data analysis, literature and case study data. The process of issue extraction and coding is presented in Figure 5.5.
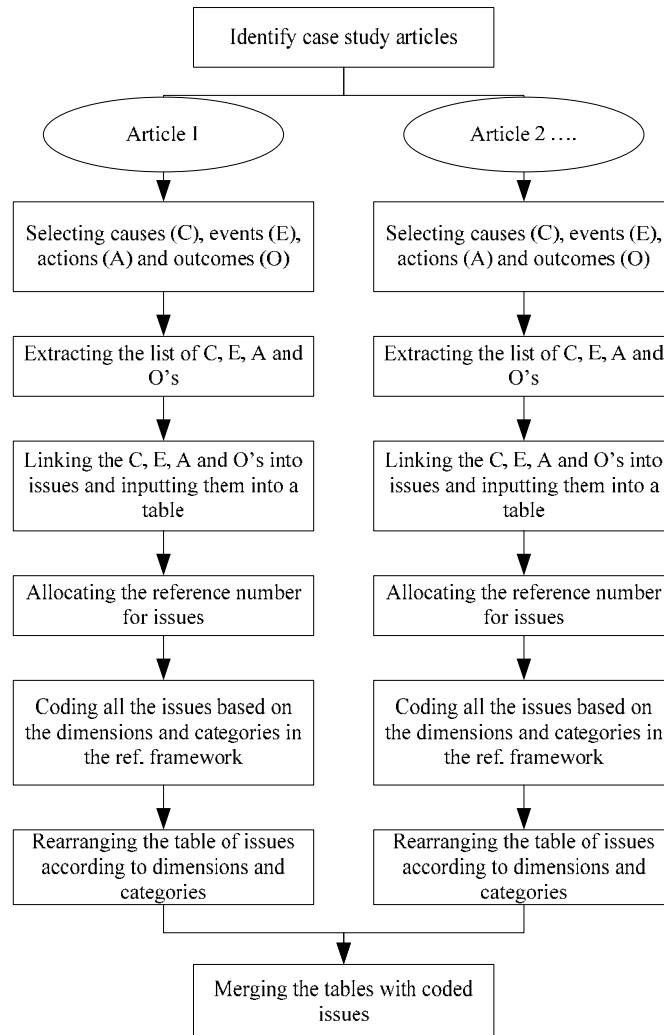
Figure 5.5: The process of classifying the Cause-Event-Action-Outcome patterns found in case study literature into the reference framework

The distribution of the results is shown in Table 7. The highest number of issues is in the process category within the business dimension, followed by social dynamics within business and the structure of the enterprise system. The fewest issues could be found within the strategy and goals of the project management. Within the dimension, business noticeably scored the highest number of issues, and within the categories it was the process category that had the highest number of issues. The issues originated from a total of 10 articles.

Category \ Dimension	Project Manage-ment	Business	Enterprise System	Total
Strategy and goals	1	9	9	**19**
Management	13	11	3	**27**
Structure	2	4	14	**20**
Process	8	19	8	**35**
Knowledge, skills and resources	7	12	2	**21**
Social dynamics	5	15	2	**22**
Total	**36**	**70**	**38**	**144**

Table 7: The distribution of the issues found in the case study literature, according to the reference framework

Looking at the dimensions, it transpires that most literature sources focussed on causes of significant events during the implementation process from the business point of view. Business structure has the lowest number of issues within the business dimension. This means that the organisational structure did not strongly affect the implementation process in the literature sources analysed, or its effect was not recognised. On the other hand, business processes have the highest number of issues affecting the implementation, which would mean that these processes significantly affected the implementation.

Strategy and goals from the project management point of view and team structure have the lowest number of issues. This leads to a conclusion that from the issues that were analysed, the structure of the team and the strategy and goals for the project were not the causes of events which significantly affected the implementation process. Another explanation would be that they were not recognised as affecting the process. Management of the project has the highest number of issues, and thus the most relevance to the events during the implementation process.

From the enterprise system point of view, the knowledge, skills and resources category, as well as the social dynamics category scored the lowest number of issues, leading to the conclusion that the consultants or vendors involved in the project, their expertise, time, availability and the social dynamics between them and the team were not causing events affecting the implementation, or that they might not have been addressed in these literature sources. However, the structure, design and functionalities of the system, and the alignment between the business and the system were often causes of events affecting the implementation process.

5.3.2.2 Non-case study literature

The issues found in the non-case study literature were extracted and classified into the reference framework following a process very similar to that in Figure 5.5. This author worked on the classification of the issues in this case and not on the issue extraction from the literature[11]. The issues in this type of literature are more generalised and come

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[11] The literature was selected and issues extracted by Francois Galasso, following the described method.

either from particular cases, from the writer's experience, or else are best practice. Table 8 below shows the distribution of the issues according to the dimensions and categories.

The social dynamics category within the business - social dynamics/business cell, encompasses the highest number of issues, followed by the process within the enterprise system dimension, and the management category within project management. The dimensions scored almost equally, but within the categories, the highest number of issues was within the social dynamics category, followed by knowledge, skills and resources. The issues were extracted from fifteen different books, articles and websites.

Dimension / Category	Project manage-ment	Business	Enterprise system	Total
Strategy and goals	1	0	1	2
Management	4	2	0	6
Structure	0	1	3	4
Process	2	0	5	7
Knowledge, skills and resources	2	3	3	8
Social dynamics	2	8	0	10
Total	11	14	12	37

Table 8: The distribution of the issues found in non-case study type literature according to the reference framework

From the business point of view, strategy and goals and process cells are not populated by issues. This could be explained either by the fact that there were no major causes linked to the business strategy and business processes affecting the implementation, or that the authors did not specifically focus on these while drawing on their experience. However, social dynamics from the business point of view caused many more events affecting these types of projects.

No causes of significant events were found to be related to the structure from the project management point of view. It can be concluded that issues such as team composition did not play a significant part in affecting projects presented in this type of literature. However, the management of the project was seen to affect the projects most significantly within this dimension.

The management and social dynamics categories from the enterprise system point of view had no issues associated with them. This leads to the conclusion either that managing the enterprise system and the social dynamics between the business or the project team with the vendor or consultants did not cause any significant events that affected the project, or that these issues were not addressed within these particular literature sources.

5.3.2.3 Practitioner type literature

Three practitioner type articles were analysed for the issues occurring in a Cause-Event-Action-Outcome pattern. This author worked on the literature selection, checking of the issues extracted from the articles and the classification of the issues[12]. The extracted issues were then classified into the reference framework. The analysis process is presented in Figure 5.5. Table 9 shows the classification of the issues.

Dimension / Category	Project manage-ment	Business	Enterprise system	Total
Strategy and goals	0	0	1	1
Management	0	0	2	2
Structure	0	0	5	5
Process	0	2	3	5
Knowledge, skills and resources	0	0	0	0
Social dynamics	1	3	0	4
Total	1	5	11	17

Table 9: The distribution of the issues found in practitioner type articles according to the reference framework

As can be noted, the articles analysed focus primarily on the structure and the processes of the enterprise system to be implemented. Overall the highest number of issues was found in the enterprise system dimension. The authors generally seem to concentrate on the technical aspects of the enterprise system, in particular on its structure, design and functionality, which can be concluded from the high number of issues found in the enterprise system/structure cell.

From the business point of view, social dynamics within the business caused significant events affecting the enterprise system implementation projects. This relates to the culture within the business and users' attitudes towards the new system. The low number of cases analysed means that it is difficult to conclude that these results are representative.

5.4   Expert validation

Two implementation experts were interviewed for the purposes of validating the reference framework and the categories on the axes. Both experts were from industry. Of particular interest to this research was the experts' opinion of the logic and the framework. The purpose of the interviews was to gauge their perception of the significance and structure of the reference framework. Both experts agreed that the framework was well structured and was relevant to business.

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[12] The issues were initially extracted from literature by Matthew Simms. This instance was also used to validate the repeatability of the method as described.

5.4.1 Expert 1

Expert 1 is a Company Director. The company specialises in the implementation of one SAP module.

Of particular interest to this research were the questions related to the concept and the model of the reference framework. The expert was of the opinion that the framework was good, and that the definition and classification of the categories and points of view was good because they covered the fundamental organisational aspects.

5.4.2 Expert 2

Expert 2 is a consultant within the Business Consulting Practice.

The interview with Expert 2 was used on discussing the changes in the reference framework (Appendix C and D), and the rest focusing on the expert's view on the reference framework. The questions to the expert were with an aim to discover how the framework reflects the processes during the ES implementation, the best and the worst points of the framework, and what might be missing from it. Based on these requirements it was decided that the interview should be semi-structured in nature.

This expert was of the opinion that the framework is much more than a reflection of the processes during the enterprise system implementation, and that it could be used by companies in many different types of processes. He saw the framework as a support in viewing the business and the system as a permanent organisation, while the project team is a transient organisation. The categories within the framework are the logical blocks which reflect what the management team does. While the permanent organisations know how to operate as they have done it for some time, the project, when it is put together, is a new entity that introduces many unknowns. This different way of operating - certainty vs. uncertainty, is what creates interrelationships between them, which need to be broken down into categories.

The framework was seen as a good reference to use to *"pigeonhole and direct resource and product"*. From a more critical point of view, there is a potential problem with classification and how the person classifying the data knows that a particular issue goes in a particular cell of the framework.

In summary, the reference framework was understood and accepted as useful means of categorising overall issues occurring during the implementation of enterprise systems. The experts agreed that it is relevant to practice according to their experience of implementations.

5.5 Emerging issues from the scoping phase

5.5.1 Benefits of conducting the case study

In the case of the specific company, the case study allowed the author to gain a deeper insight into the 'real' implementation process, and how it could be conducted. In addition to this, it helped in gaining a better understanding of the interview and focus group processes and the skills necessary to make them successful. The focus group was found to be very difficult to manage, as the group had its own dynamics, which was difficult to interrupt. For example, if one participant started complaining, the next one

would join and the 'moaning session' would quickly escalate. This might have been an expression of a form of peer pressure, and it is clear that data collected in this way might not represent the 'real' opinions or experiences of the people involved in the focus group. Additionally, the Business Project Manager was present in one of the groups, which might have made the other participants feel obliged to present the situation as far better than they actually perceived it. Due to the fact that many participants were present and that the group had to make the decision about which issues were most important, the time allocated was insufficient to collect three full chains of events. The groups were difficult to arrange as the participants had to be available at the same time for the same length of time. Considering all of the above, further research should not use this form of data collection as it is not seen as efficient use of resources.

46 chains in total were collected, which would allow further focus of the research in a specific area of the reference framework.

5.5.2 Benefits of conducting the literature analysis

During the research process, a number of literature sources have been identified as useful for the purpose of this analysis. These include books, academic papers, practitioner articles and Internet resources. They have been used with various level of success to extract the data. Most data came from the case study academic articles. These articles provided the deepest insight into the implementation process in a specific context. The books and web resources were the second most beneficial literature resource and they provided more general data, in most cases based on the writers' experiences or best practice rather than set in a specific case context. Practitioner type literature found mainly in trade magazines has been of limited use.

The challenges of using different types of literature have been diverse. Many of the issues did not have a complete C-E-A-O chain, more so in the case study and practitioner type literature. Consequently, the improvement actions and outcomes were not presented. In addition to this, the context was often missing. It was not always possible to determine what was manufactured, in what country the company was or how many employees it had.

Bias from the authors was noticeable when case study articles were used. For example, if a particular theory is applied on the data collected, this would slant the issues in a way that each article would have noticeably more issues in several cells of the framework, while the issues from another article would mainly populate some other cells. How much of the chain was present also depended on the author's purpose of writing the article. Overall, identification of the academic articles with a significant number of issues in the appropriate format was laborious. However, these articles were rich in detail.

In case of the non-case study literature, the chains of issues were in less depth and there was significantly less information about the context of the implementation.

The practitioner style literature was least studied because many serious drawbacks were identified. In some cases, there were no specific issues but only abstractions of them. The timing of writing the article affected the length of the C-E-A-O chain, so when written early in the implementation process it only contained causes and events rather than the whole chain. Additionally, the reliability of articles was not certain, since they

were not peer reviewed and some of them were used as success stories and some as 'implementation nightmare' stories.

5.5.3 Benefits of conducting the expert validation

The expert validation was significant in that it provided reassurance that the classification of issues corresponds to the reality of enterprise system implementation as it is in practice.

5.5.4 Emerging issues

The scoping phase of research focused on answering two main research questions:

- What human, organisational and technical problems are encountered during the implementation of an enterprise system?

- What is the most prominent issue affecting the implementation?

The first question has been answered in work presented above. However, the answer to the second question did not come directly from the data analysis which was performed during the scoping phase. On the contrary, if the issues populating the reference framework were analysed more closely, without having the context of data collection in mind, the importance and relevance of one particular and most prominent issue would not be obvious.

Communication emerged as the main issue of interest, and was recorded in a few chains as one of either causes or events. It permeated many of the issues which were classified in the framework in different boxes, rather than only within the social dynamics box, as might be expected. However, it surfaced most prominently during one of the focus groups conducted with the core and extended team members with a very strong reaction from the participants.

During the focus group, the participants went through the brainstorming of the issues, grouped them, and then allocated points to the most important group in their opinion. This process is explained in more detail in Section 5.2.3. The issues were grouped under the headings of people management, training, communication, business requirements, and time. Communication gained the highest score, followed by people management and time.

Under the heading of communication the participants gathered various issues. Location was seen as a barrier to communication, as some decisions were made at the meetings at short or no notice, without the participation of the team members who were on the team officially but located elsewhere, and then these decisions were not communicated. There was a perception of secrecy surrounding some of decisions. Additionally there was an issue of not communicating the changes in the departmental work, organisational structure and process changes, and the planning for the unknown reflected in these changes. There was also a lack of understanding of 'who does what when'.

When the issue was selected and put on the chart, the causes of the occurrence of this event – communication and lack thereof, were very different. The stated causes were: change; not understanding changes; decisions not being made and hence no communication; uncertainty whether the project management were aware; uncertainty

as to whether the changes were known but not communicated, or simply not known, but participants did not know which; uncertainty about who should communicate and who had information; staff reduction and expected job changes; lack of time; spreading of rumours; communication coming from the middle management, rather than from the top, thus creating uncertainty about who was responsible for making decisions; and the reliability of those decisions if the top management did not know about them.

One communication issue which arose from the other focus group, which was made up of key users was that there was a lack of communication about how things were going to change due to the lack of decisions. The outcome from this was that there was an impression within the group that the jobs were not as secure as they had been and that the employees did not know whose jobs would be affected, but that restructuring was certainly going to happen. In addition, another issue identified during the data collection at a one-to-one interview was regarding the lack of time encountered by the core team. This was then reflected in their not having sufficient time to communicate, and the core team acting as a communication barrier (Figure 5.3).

Although communication issues were not significantly present in terms of percentage in the total number of issues, they had a great effect for the functioning of the project team, both within the core and extended team. At the same time, the literature is particularly silent on the communication related issues in the accounts of the case studies. These are the main reasons why further study of the communication issues during enterprise system implementation was deemed necessary to better understand the implementation process and answer research question 2 from the scoping phase.

The analysis of literature was conducted in support of the case study data. The literature analysis supported answering research question 1 and, by the lack of issues related to communication and corroboration with the case study, indirectly answering question 2. Although the issues in the social dynamics of the business category in academic literature were most prominent, only one relates to communication issues. This shows that communication has not been studied nor observed as one of the problems reported in case study articles.

Following on from the above, a question can be raised regarding the communication processes and their role in the implementation of an enterprise system. The next chapter sets the scene and begins to answer this question, which is directly related to the research questions 3 and 4. Further analysis of this point will follow in the discussion in Chapter 7.

6 COMMUNICATION ISSUES DURING ENTERPRISE SYSTEM IMPLEMENTATION PROJECTS

This chapter focuses on the study conducted during the second phase of research in the light of the findings from the scoping phase. The purpose here is to present the substantial data used for extracting the findings and for discussion in Chapter 7. It presents evidence for the findings from two case studies with the focus on communication processes and their effect on the transfer of the psychological ownership, anxiety about change and employee commitment. Additional themes that emerged from the data are presented, as well as the validation of the data classification process.

6.1 Case study in Drillco

6.1.1 Case selection

Drillco was selected as suitable for a case study for several reasons. These were:

- the location of the company - England,

- the market segment - machining subcontractor, manufacturing,

- the system type – a built-from-scratch enterprise system, rather than an off-the-shelf system.

The company size was initially thought to affect the company's suitability for a full case study. The company falls within the SME segment with its 26 employees, and at this size, it was expected that the various communication problems present in large companies would be absent, and would not manifest themselves. These problems would include the problems occurring due to the scope of the implementation, the scope of change itself, and the size of the project team. Additionally, the problems anticipated due to location were expected to be absent as all the employees are located in one facility.

The company was part of the consortium (Section 6.1.2). A system developer was employed by the consortium to develop a system suitable for all its members. The parallel can be drawn between each of the SME companies in the consortium acting as a department within a larger company, albeit contractually joined by the consortium agreement rather than into one company. If the consortium is then studied as one unit, this case study was dealing with the implementation within one 'department' of a unit. Additionally, the company data itself was sufficiently rich and contrasting to data from a large company that the decision was made to analyse it fully.

The timing of the researcher's access was just after the new system was switched on, as the system went live approximately one and a half months earlier. It was expected that the major events would be remembered from the time leading to go-live.

6.1.2 Case background

Drillco as a company has been in existence since 1994, and currently employs 26 members of staff. It was originally created as a subcontracting machining company, as it discovered a niche within the market around the problem that buyers of

subcontracting machining were experiencing. The problem was related to the lack of single companies offering this service, which meant that the buyers needed to involve several companies in order to obtain the product they needed. This resulted in higher costs and required more time.

In 1997, the company formalised its strategy to provide a comprehensive service by fully manufacturing the components itself. This plan was based on the feedback the company received from its customers and suppliers. The plan was to invest in the continuous improvement of quality and the range of services on offer to the customers.

The project to start building an enterprise system was initiated in the summer of 2001. The company previously ran an MS DOS based system. The possibilities for replacing the old system with an off-the-shelf system had been explored, but the systems on offer were deemed too expensive and could not provide the functionality to match the old system. Operability of the systems was also assessed and it was found that the Windows based systems available would take longer to learn. The company managers believed that it would take longer for the system users to learn to use a mouse, rather than the keyboard, in order to execute commands. This also featured as one of the reasons for building the system, which would involve the same commands executed by the same keys on the keyboard, as they were on the old system.

In order to realise the funding for the new enterprise system development, the company directors decided to create a consortium of companies in which each of the companies would invest into the development. The consortium companies were recommended by the System Developer who had been in charge of the old system. He suggested the members based on the system they were already running, which was the same as the one used in Drillco. An additional member of the consortium was suggested by one of the companies. The five members signed a consortium agreement at the end of 2001. It stated that each company would pay the System Developer the same amount of money, while in return, he would deliver a Windows based system with the same functionality as the old MS DOS system, within two years.

The starting point of the system was decided half a year later and the new system was to provide the same functionality as the old system. Visual Basic was selected to be the system language. The system was first implemented in summer 2002 in the one of the companies in the consortium. The System Developer kept working on the new system until the second implementation took place at another consortium member close to the end of 2002.

A company was formed in late summer 2004 to be in charge of the system and its development. The Board of the company comprised two representatives from each of the consortium members and the System Developer.

The system was purchased by a company external to the consortium in September 2004 but had not yet been implemented. This allowed an additional two months of funding for the development. Another two companies had paid the deposits for the system at the time of data collection. The purpose of these activities was for the sales of the system to enable further funding of the development. More functionalities were planned to be added when the system was sold to companies that would need them. The new versions of the system would then be available to all members.

When the system was developed to an acceptable level for it to be used at Drillco, some of the data was transferred to it. This dummy system was implemented to allow the

employees an opportunity to practice, when time was available. This also enabled the identification of bugs in the system and their elimination by the System Developer.

The implementation took a big-bang approach as, over one weekend, the old system was switched off, and the new system was put in and switched on. The following Monday the employees were working on the new system. The training took place on a one-to-one basis during the first day of system operation. Further remote assistance was available if necessary, as the System Developer had remote access to the employees' work stations.

Unlike most enterprise system implementation projects, this implementation did not involve any business process reengineering. The new system was the exact replica of the old system, but on a different platform and with added functionalities.

Initially, it was planned to conduct a case study within another member of the consortium, during the last phases before the go-live. However, as the system implementation by those members was postponed and there were serious problems in the relationship between the members and the System Developer, it was deemed sufficient to conduct the study within Drillco, where the main consortium contact was. The reason stated by the company for taking part in research was due to its previous relationship with the University and the willingness to be of assistance in research.

6.1.3   The approach to data collection and data analysis

The data was collected one and a half months after the go-live. Three semi-structured one-to-one interviews were conducted in order to collect data. The participants were the company Director - Project Manager and senior management stakeholder; the Accountant - key user/end user, and the Quality Manager - key user/end user. Initially, background information about the employee, their educational background, time with the company and involvement on the project was collected. More specific information about the organisation of the project and the company was collected from the Director. The interviewee was then asked to describe the project phase details as they remembered them. They were then asked to provide information about any events that significantly affected the implementation process. They selected the three most important communication events which were then described in the form of a C-E-A-O pattern. Finally, the event was assessed by the interviewee depending on how it supported or hindered the implementation process in terms of the ownership transfer from the management to the users, the employee loyalty, and the reduction of anxiety about the changes to come.

6.1.4   Case data analysis

Data obtained from the interviewees was recorded in the form of charts used during the interviews, and tape recordings and notes. This was done in order to gather as much information as possible. The data from different interviews was allocated a reference number to be easily identifiable according to the company, interviewee, and cause and event or process that the interviewee identified. The causes from the charts were coded according to the content, and the event according to the reason or meaning of its occurrence. The communication events are presented below in Section 6.1.4.1 and the causes for the events in Section 6.1.4.2. Then the summaries or transcripts of the interviews were coded for the issues related to ownership, anxiety and commitment. This is presented in Section 6.1.4.3.

From the interviewees' responses the communication events which were identified as significant could be classified according to four categories. These were: strategy, management activities, such as planning and announcements, technical knowledge exchange, and technically related communication events.

The discussion about the future company needs of an enterprise system is classed as communication related to strategy. Examples of management activities include an announcement of the new system implementation, with the purpose of gaining employee commitment and a planning meeting with other consortium members. The category of technical knowledge exchange included the communication between the employees about the testing and trying of the dummy system and training activities between the System Developer and the employees. Finally, the technical category included exchange regarding a request for requirements of the system. Table 10 shows summaries of communication events from C-E-A-O charts used during interviews which were classified according to categories.

Communication event	Category	No of occ.
Discussion with the System Developer about the requirements for the future and how the old system would not meet them, about developing the new system, about costs, and the possibility and practicality of time scales	Strategy	1
The meeting to propose the plan and list costs, timescales, investment and final product and to assess needs and desires for such a new system among the consortium members The meeting to ask the company team if they were prepared to enter into developing this new system with the System Developer Announcement of the new system to the team [same as above]	Management	3
Use of a dummy system to trial and test the system, and working and discussing the system with colleagues Training	Technical Knowledge Exchange	2
Verbal request as to [end user's] needs/requirements of the system to enable me to work more effectively	Technical	1

Table 10: The summary of communication events according to categories

The main difference between the technical knowledge exchange and the technical category is in the purpose. The purpose of the former is to improve the understanding and use of the system, while the purpose of the latter is to increase knowledge in order to build the system.

It can be noted that within the management category, the same communication event was classed as significant. The event involved the announcement of the new system to the team and gaining team support and commitment.

6.1.4.2 Causes for communication events

Causes for significant communication events were classified into categories according to the theme of the cause. Five groups emerged. The technical reasons for

communication were seen in most cases to be reasons for communication events, and seven of the eleven causes were in this category. This was followed by one cause per category in strategy, management, resources and the image of the company. Table 11 summarises the causes for communication events from the C-E-A-O charts used during the interviews.

Causes for communication events	Category	No of occ.
Needed other investors and broader opinion of what would be needed in a new system of this type to ensure it could be generic	Strategy	1
Wanted a new system but could not afford the £100k alone	Management	1
System Developer has previously caused problems through lack of support or being contacted at urgent times due to him being the only support for the old system	Resources	1
Implementation of 2000 + XP MS DOS programs cause problems, so it was necessary to downgrade to Windows 98 MS DOS system changes and new developments were becoming difficult as screens were full and did not allow new fields After looking at other systems, realising they were not user friendly for the requirements New computer system installation Installation of dummy system Installation of computer system Pending installation of new software in November 2004	Technical	7
Windows was operating system of all modern systems – the company looked old fashioned.	Image	1

Table 11: The summary of causes for communication events according to categories

It can be noted that within the category of technical causes, installation of the new system or dummy system was stated as a reason for a communication event. Considering that the communication events were on a high level, for example training, or testing the dummy system, the causes too were on a high level of abstraction. It can be stipulated that for every communication event related to the implementation of the system, the actual implementation would be the main cause of the event.

6.1.4.3 Themes of ownership, anxiety and commitment

Every interviewee mapped the communication event on a chart with the cause of the event, the actions taken, and the outcome. After the explanations of these, the interviewee was asked to assess the communication event with regard to it hindering or supporting the implementation of the system, in terms of the transfer of ownership from the management to the end users, loyalty and reduction of anxiety about the coming change.

Ownership

There are several ways in which the interviewees saw the transfer of ownership. The Director saw it as both transfer from the System Developer to the top management – herself and the Managing Director; and from the top management to the end users. The users saw it as the transfer of the ownership for the system to them.

In terms of the way the Director saw the transfer of ownership from the System Developer, she referred to the meeting between herself, the Managing Director and the System Developer as a communication event. The meeting involved a discussion about the company requirements and about the ability of the old MS DOS system to meet those requirements, as well as the possibility of developing a new system and the cost and timescales for the development. During this meeting, the ownership was seen to be transferred from the System Developer to the Directors. She stated:

> *"Ownership was transferred to [Managing Director] and myself from the System Developer because we'd get the system we'd like, we would design and he would write."*

The transfer of ownership from the top management to the two key users happened during the communication event represented by a meeting between the Directors and two key users. At this meeting, the implementation was announced formally. The Director commented on this event in the light of ownership transfer:

> *"...this event had to happen otherwise there would have never been any ownership. And we wouldn't have had the support in the first place."*

During this meeting, the key users were asked to contribute to the development of the system with regard to what their requirements were. The Director commented about using this way to transfer ownership:

> *"...all along the development of the system we've asked people what would they like in the system, how would they like it to work, so there has been an amount of feedback from key personnel about what they would like it to do and how they would like it to be done. Which again... at least there is a bit more of an ownership there 'cause if they see a feature that they suggested, they feel they've had a part of it."*

The key user selected the communication event related to the verbal request for the needs and requirements of the system which would enable her to work more effectively. From her perspective, she felt that the event contributed in her owning the system more. She felt that she was a part of the development of the new system and that her needs were an integral part of the business.

Another communication event selected by the key user was the use of the dummy system and discussing and working with the colleagues. When asked about ownership she commented that the purpose was to become familiar with the system.

The last selected communication event by the key user was when the new system was announced. This event had no effect on the transfer of ownership.

The only communication event selected by the end user was the training. The end user knew that when the system went live, he would be able to access the system and have a

basic understanding of it. This contributed towards his feeling that he owned the system more.

Commitment and loyalty

Loyalty of the people involved in the project was addressed as one of the areas of interest during interviews. The Director spoke about top management loyalty, loyalty of other companies in the consortium, employee loyalty and the loyalty of the System Developer. The key user and the end user both spoke about their own loyalty to the company.

The Director selected the meeting about the requirements and the ability of the old MS DOS system to meet those requirements, including the possibility of developing a new system and the cost and timescales for the development. Referring to the meeting between herself, the Managing Director and the System Developer, the Director saw top management loyalty increasing due to their financial involvement and involvement in the new system design. She stated:

> *"Mine and [Managing Director's] loyalty to the project was increased because: a – we were investing into it, and b – we knew we were allowed to input into it."*

In terms of the loyalty of the parties involved in this meeting, the Director spoke about the contractual side of the relationship where both the top management and the System Developer were gaining from the contract:

> *"It increased his loyalty to us and our loyalty to him because it was a contract we were entering into together. We knew we'd get a system we'd have a major input into, and he knew he'd have financial support to write it… We were both getting what we wanted… "*

The second communication event selected by the Director related to the meeting between the companies in the consortium with the purpose of writing the contract and gaining commitment from all the parties involved. The relationship between the other companies in the consortium and the System Developer was raised here. An increase in loyalty between the System Developer and the other companies was perceived to be the same as between the System Developer and Drillco, addressed in the third communication event below.

The third communication event was related to the announcement of the system to the employees and gaining their commitment to accept the system provided by the System Developer. During his previous position as the sole person providing old MS DOS system support to the company, the level of support was not perceived to be adequate. His response to customer requests was not always as fast as was required. However, one of the actions which followed on from this meeting was that commitment was gained from the System Developer to improve the support level.

Here, the Director saw the employee loyalty increasing because she thought they felt they were given a choice rather than being forced into a situation where the new system supported by the same person would be implemented without their input and without their choice. She stated:

> *"It supported the employee loyalty because they felt they had been given a choice rather than being told that this is the way it is actually going to happen, and we asked for their feedback in how they wanted it to happen."*

The key user selected the verbal request of her requirements of the system as the first communication event. In terms of loyalty, she felt good about the implementation. She stated that the request was a:

> *"...cherry on the cake."*

The second communication event was selected to be the installation of the dummy system to practice with and the discussions with the colleagues about the system. In terms of loyalty, the key user felt valued because she felt that her opinion mattered.

The third communication event chosen by the key user was related to the announcement of the system implementation, which was conducted in an informal way by the two members of the top management with two key users. She felt her commitment was high anyway, but that the way the announcement was done was *"nice"*.

Training as a communication event was perceived by the end user not to have an effect on his loyalty.

Anxiety

The interviewees were also asked how the communication events affected the level of anxiety. All interviewees addressed how the event affected the anxiety of the employees. The Director talked about the level of anxiety in the employees and the key user and the end user talked about their own anxiety.

The Director's third choice of communication event was the meeting with the key users to gain support for the system. The design of the system was one of the issues addressed during the meeting. According to the Director, the discussion about the design issues and the choice of a system with the same characteristics as the old system reduced the level of anxiety among the employees. She stated:

> *"I think that having the system itself rather than the new system, it reduced the anxiety because we knew what we were getting, we knew that it was going to be a Windows version of the system we'd used before, so a lot of the features were already familiar, whereas starting with a new system would cause major problems and major anxieties, because things aren't called the same or they don't look the same."*

According to the director, this meeting also contributed to reduction of anxiety levels among the employees regarding the support they would receive from the System Developer. She stated:

> *"I think the meeting reduced the anxiety because we had to reassure them that they were going to get the support from [System Developer] and from us…"*

The key user selected the verbal request of her requirements of the system as the first communication event. She stated that while responding to the request there were:

> *"...frustrating moments and the fear of the unfamiliar."*

However, this involvement made her feel *"pleasantly anxious"*.

The second communication event selected by the key user was the implementation of the dummy system. The key user addressed the level of confidence rather than anxiety. She stated that it gave her confidence because:

"...you know you'd not damage anything."

Regarding the third selected communication event, the announcement of the new system, the key user felt that the date for the go-live was still sufficiently far in future to be anxious at the time of the event.

The end user selected training as the communication event. The training of the end users was postponed to be closer to the go-live date, which was linked to the fact that the end users on the shop floor could not use the dummy system on their PCs. In terms of anxiety, they were becoming *"extremely anxious"* that they were getting close to the date and they were not able to use the system. The training thus reduced the level of anxiety.

6.1.4.4 Other themes: organisational structure, camaraderie and trust

A few themes emerged from this study which were not initially anticipated. Considering that the organisational structure is very flat in a company like Drillco, it was possible to identify certain issues related to the distance between the top management/project management and the key/end users. The communication between them could be classed as formal as the communication channels were structured a priori. However, the announcement of the new system was done in an informal atmosphere over a cup of coffee, as the key user noted. Considering that the communication was between a small number of employees, it can be seen that although official structured channels exist, there are not enough people in the company on the same level of project involvement for the communication channels to be unofficial, and thus for the communication to be informal. So in this case, the formal/informal communication divide is blurred and it depends on the setting and content.

Additionally, when the Project Manager/top manager announced the system, the employees were given a choice of the system and system support, rather than having the management choice imposed on them. This denotes the issues of trust that the management had in the users to make the best choice, as well as enabling organisational team cohesion to take place through this action of trusting and handing over the responsibility.

Positive outcomes of communication by the key user were seen to be the camaraderie between her and her colleagues, which was present as they had previously discussed their ideas and options together. Additionally, the system as a focus of team activities enabled her to gain awareness of colleagues' needs as well as her own. So, in effect, the system and the activities around the system enabled team cohesion to take place on the same hierarchical level.

6.2   Case study in Healthco

6.2.1   Case selection

The company was chosen to be approached for a case study, as it satisfied several main criteria set by the research objectives:

- the location of the company - England,
- the company size – large, over 250 employees,

- the market segment - retail,

- the system type – off-the-shelf system, SAP,

- the timing of the researcher access - several weeks before going live.

Most importantly, it was hoped that the research conducted in the company would provide the company with insight into further improvements that could be made with regard to the communication issues during the implementation process. From this point of view, the use of the research conducted is twofold: on an individual level, and on the organisational level (as stated in Section 5.2.1). As the results were reported to the selected members of the project team, an additional aim of this exercise for the company was to gauge which communication issues were relevant, and how to best target communication efforts. Prior to the entry into the company, an additional Business Readiness Assessment exercise was conducted by a consultancy, which addressed various implementation issues.

6.2.2   Case background

The company, Healthco, was selected for the case study within Phase 2 of the research. It is a large international retail company with over 250 employees within the healthcare industry in the UK. Its UK sales and marketing arm is Healthco UK. Healthco is a part of a larger group of companies and is located at the headquarters site. The group began operating in the 19th century, starting as a small family business. The companies within the group have links in that some of the initiatives are on the group level, for example the introduction of an enterprise system. Additionally, members of staff working solely on projects, rather than full time in a functional role, might move after the end of one project to another one in a different part of the group. The company operates in approximately 30 countries around the world with open selling of its products to over 130 countries. The sales in 2004/2005 were over £500 million and the profit was around £90 million.

The company was in the process of implementing an SAP system. The project was approved in May 2003 when the design phase started after the initial feasibility study. In September 2003 the programme was officially launched and the project structure was created. The detailed design of the new ways of working, the impact of the changes and the assessment of benefits was completed by December 2003, which was then shared with the company leadership. In January, the solution delivery and implementation were approved by the group Board. In February and March of the same year, re-planning took place to account for the changes requested by the Executive Committee and local implementation teams were created.

The enterprise system implementation programme was a part of the company change programme with the purpose of achieving the target of accelerating the *"organic growth rate through innovation and faster, better decision making"*[13]. The purpose of the enterprise system was to *"build a more agile, streamlined and effective organisation enabling Healthco to invest in brand and geographic expansion"*[14]. The system implementation project was focused on seven core areas: the supply chain, sales

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[13] Company newsletter, June 2004.

[14] Company annual review, June 2004.

and customer relationship management, customer service, marketing, product lifecycle management, finance, and human resources.

The implementation comprised three phases. In Phase 1, the local company in the UK and in Ireland went through the implementation. Phases 2 and 3 were to include implementation in company offices abroad. The initially planned go-live date in Phase 1 was at the end of October 2004, with the go-live in Phase 3 in August 2005. The contract for the system implementation was won by a consultancy, part of the company to which the IT system support and maintenance is outsourced.

Initially the project had numerous difficulties and the go-live date was postponed for nine months at a cost of approx £1 million per month. The project management and the project structure were changed, which helped in getting the implementation back on track. During this period of getting the project back on track, the project personnel changed. The person who was responsible for the links with the business was promoted to be a Project Manager, replacing the previous Project Manager, and hence left a hole in the project structure. It took a few months until a replacement was identified and during this time the project team had difficulty communicating with the business. Lack of communication between the project team and the business was stated by the company as one of the main reasons for interest in this research.

6.2.3   The approach to data collection and data analysis

The data was collected three months prior to the final go-live. Eight semi-structured one-to-one interviews were conducted in order to collect data. The participants were the Programme Manager as the senior management stakeholder, the Global Business Implementation Manager as the project manager on the business side, Transition Manager, IT Consultant, two key users and two end users. Initially, background information about the employee, their educational background, time with the company and involvement on the project was collected. The interviewee was then asked to assess the strengths, weaknesses, opportunities and threats of the communication within the project and fill in the SWOT chart. They were then asked to fill in the communication C-E-A-O as presented in Figure 4.4. More discussion followed regarding the issues of ownership, commitment and concerns.

Once the data was collected and analysed, the findings were presented to the members of the project management and business implementation team in a workshop format. The participants discussed the findings and the actions that could be taken to minimise the threats and weaknesses. This opportunity was used to validate the project 'truth' as understood by the researcher, as well as to enhance the understanding about the project from different perspectives.

Notice boards were used to capture project information and were located in close proximity to the project team. Figure 6.1 and Figure 6.2 depict some of the project posters. Figure 6.1 shows the main project notice board, with the project name and objectives. The project objective is stated as:

> *"To successfully deliver a standardised and integrated business process and data infrastructure across our global operations, SPCs and centre, supported at the core by SAP."*

'SPCs' and 'centre' in the above statement refers to the Strategic Profit Centres abroad and the headquarters. In order to achieve the objective, the poster states that:

> *"...we will:*
>
> - *adopt a holistic approach to improving processes, organisation, technology, information and behaviours*
>
> - *change the way [the company] does business*
>
> - *ensure full engagement of the business*
>
> - *be benefits driven".*

Figure 6.2 shows where the project actually was in terms of one of the project activities, in relation to where is meant to be according to the plan.

The project intranet site showed various project facts and figures for information purposes.

Figure 6.1: The project notice board[15]
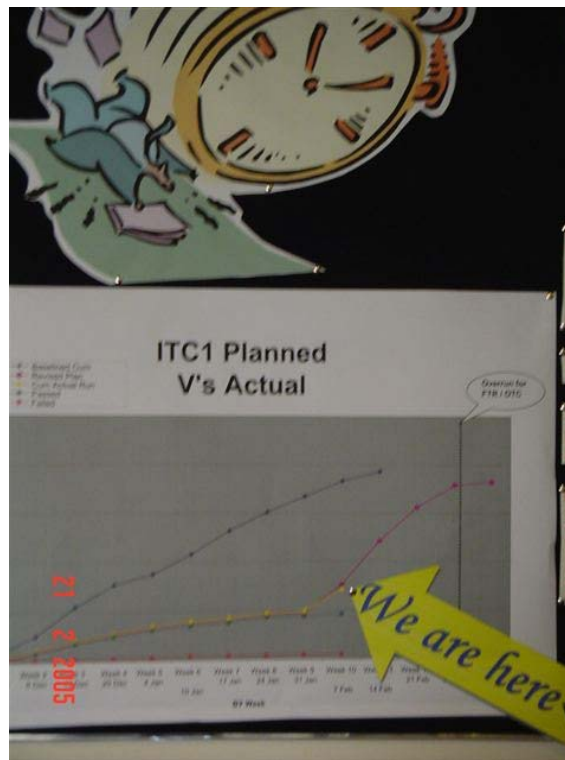
Figure 6.2: A project activity timeline

6.2.4 Case data analysis

The findings relate to three themes which emerged from the interviews. The first theme explores employees' awareness concerning the aims of the ES implementation. The second theme deals with the communication issues raised by the employees, which represent both strengths, weaknesses, opportunities and threats, as well as the communication successes and barriers. The third theme relates to the transfer of ownership, and the commitment and concerns about change.

6.2.4.1 Awareness of the ES aim

All of the interviewees were aware of some of the expected benefits of the system implementation. These were stated as: aiding restructure of company operations and giving the company an opportunity to grow further, replacing the old and out of date systems, cost savings, time savings, and creating an integrated system rather than having individual data storage mechanisms, e.g. emails, CDs, personal or shared drives, etc. On an individual level, the system was expected to enable the employees to be more autonomous, to make the decisions faster and to be able to access the information more easily. This information had been repeatedly communicated through the company newsletter, the annual review, and whenever there were large update meetings between the management and the employees.

Although all the interviewees, to a certain extent, were informed of the overall, larger purpose of the ES implementation and what benefits the system would bring to the company, details concerning changes specifically for the employees using the system were absent in the communication process. Furthermore, super users were aware that this information was missing, and felt incapable of answering the queries by the end users related to it. They did not seem able to filter out the more technical type of information relevant to the end users, as they tended to receive general emails aimed at everybody on the project. This problem was eased when the Heads of Departments started to communicate with the end users via regular email briefings.

6.2.4.2 Strengths, weaknesses, opportunities and threats in project communications

Within the SWOT charts that the interviewees filled in during the interviews, several groups of issues emerged. These were:

- Strategy

- Motivation

- Knowledge:

    o Detailed, individual picture

    o Bigger picture

    o Keeping informed

    o Technical issues

- Communication across the project

- Communication structure and process

- Facilitators

Strategy

The strategy group of issues relates to the overall goals of the project and the communication strategy during the project. The issues were identified within the strengths of the communication and threats to the communication during the project.

The Senior Manager, who was a project stakeholder, identified the strength of project communication to be that it is integrated with the programme and the business. He wrote in the SWOT chart:

"Communication is joined up + integrated with prog. + business"

He also raised the issue of the final delivery of the project from the top management perspective to be the delivery of the financial benefit, rather than the implementation of the system. He stated that:

"Endpoint is the benefit delivery, not delivering the Δ [system]"

The IT consultant identified one issue within the strengths of the project communication to be that there is one goal which needs to be achieved by everybody on the project. He stated in his chart:

> *"One goal to be achieved by all project members – requires good communication"*

An end user from the Marketing Department identified a clear objective and focus to be one of the strengths of project communication.

The significance of the project was also stated as one of the communication strengths by the end user from the Marketing Department. She stated that it was a big, high-value initiative and that the project had the executive support as communication strengths.

One of the strategic issues of communication was identified by the end user from the Marketing to be a threat. This issue related to the employees within the business taking the project on board and being committed to it. She wrote:

> *"Everybody in the business needs to buy into it otherwise project could fail"*

Motivation

Motivation as a category included only few project communication issues. One of them was stated by the key user from the Marketing Department, who stated that project team members' desire to communicate was one of the communication strengths. Another issue which was classed here was seen as a threat to project communication by the Marketing end user. She stated the problem of communication needing time and people's involvement to be conducted.

Knowledge and awareness

The category of knowledge and awareness included all project communication issues relating to the knowledge or raising of awareness of the people affected by the project. The knowledge or awareness specifically related to the detailed issues affecting the individuals; to the bigger, organisational picture; to keeping informed about the project's progress; and to the technical issues. Knowledge related communication issues were classified within the weaknesses, opportunities and threats to project communication.

Knowledge issues that were seen as weakness to the project communication, within the individual picture subcategory, related to the end users not knowing how the implementation of the system would affect them. Issues raised here by the key user from Marketing were:

> *"Often, doesn't say how/what, just it's changing, it's new!"*

> *"What's new + what does it mean to me"*

A similar issue was raised by the end user in Marketing:

> *"Communication should not just be about [the project] but about what exactly is going to happen to who and when"*

The marketing key user also raised the issue about the extent to which project communication was relevant to the users. She stated that it was:

> *"Not relevant enough"*

In terms of the communication about the broader issues, the key user from the Finance Department stated that the detailed communication to the key users about the system design was a weakness in project communication. She identified:

"Communication to super users of details of design in their workstream e.g. middle ground – workshop with the appropriate BTL [Business Team Leader] when super users began"[16]

In relation to keeping the affected parties informed about the project progress, two weaknesses were perceived. The key user from the Finance Department identified the problem with the change team not communicating their log and keeping others informed of it. She wrote as one of the weaknesses:

"Change team communicating their log"

The end user from the Finance Department identified the issue of the constantly changing timetables and keeping track of these changes as a problem. She wrote:

"Timetable seems to keep moving – difficult to keep track of the latest news!"

Further knowledge and awareness related issues were seen as opportunities for project communication by the interviewees. These included one opportunity seen by the Senior Stakeholder and two identified by the Marketing end user.

The Senior Stakeholder identified as an opportunity for the project communication to:

"Be more 'content' focussed"

He stated during filling in of this part of the SWOT chart:

"You need to communicate something worth communicating. And there was a lot of communication around: "This will be a huge change and it will involve everyone and it's the big thing that's coming". And at the end of the day people don't want to hear that, they want to hear what it is that is coming, they want to hear the content"

One opportunity was seen by the end user to be in the need of the users to understand detailed information about the impact of the system on them. The other opportunity was seen in increasing communication about the future activities for the users, e.g. training. The two opportunities were expressed as:

"Need to understand the 'nugget' better – more details about how it will affect the individuals"

"Communicate more about next steps, e.g. training, date for go-live, etc."

Further knowledge and awareness issues were seen as threats to project communication. On the level of an individual, the Marketing key user identified the issue of insufficient information. However on the broader level, she stated that there was too much information, which forced people to *"switch off"*.

On the broader organisational level, the IT consultant identified the organisational change management as a threat to project communication, and he did not know how far the change management had gone. He was uncertain about how ready the organisation and the people would be if the system were to go-live. In addition, the complexity of the project was seen by the Marketing end user to be a threat to project communication.

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[16] Healthco employees used the term 'super user' instead of 'key user'.

Further lack of knowledge on technical issues was seen as a threat. The IT consultant stated that people had concerns about how far developed the system was along the project cycle. He wrote:

"Solution is still in design mode only days away from test cycle 2"

The Marketing end user was not aware of the steps to take, should a technical problem occur. She wrote as a threat:

"What if there's any technical problem?"

Communication across the project

Communication across the project was defined as communication between the project team members about the project. The focus here was on the means of communication and what was put in place for communication to happen, rather then whether the communication was happening and what might hinder it. This category only appeared in the weaknesses section of the SWOT chart. One of the identified weaknesses in communication across the project was identified by the Project Manager, although he believed that it was improving. He stated:

"It is very easy because of the pace of each of the phases of the project for people to get lost and not understand the bigger picture of the project. Because we didn't have all of these things within the project, it can get lost. We are getting better at it, really, we have more communication events now."

Although this issue initially related to the structure of communication, the focus as raised by the Project Manager was the content of communication, which was facilitated by putting regular 'cathedral' meetings in place. These meetings were so called because they would take place in a large hall, which reminded people of a cathedral. During the cathedral meetings, which were scheduled every two weeks, around 200 people would attend. The topics of the meeting would be the project updates, a piece on change management, or testing. The Transition Manager and the Programme Manager would normally lead the meetings. The Project Manager stated:

"…it is not just around the opportunity for people to be communicated to across the project, it's about the way we communicate to people across the project. We have a lot of experts in specific areas in the project; what that means is we also therefore have a lot of people who don't understand a lot of parts of the project, and it's always very hard for somebody who is expert in something to explain successfully and quickly to people who know nothing about it. And we've got a real mix on this programme of business people, consultants, people with generalist skills, maybe people with specific skills…"

Further weakness was in language skills on the project. This was identified by the Project Manager in relation to future system releases to the Strategic Profit Centres abroad. From the communication point of view, when the company moves into other releases, it will be more difficult as the Business Implementation Managers will be from the area but the link between the project and the Business Implementation Manager will be dependent on the language. He was planning to restructure the programme so that the people from the country where the system was being released were brought to the headquarters to work on the project. In that way the project would benefit from their language skills.

One of the weaknesses regarding communication across the project identified by the Programme Manager was that too much was assumed about what the rest of the company and the users would understand. He stated that:

> *"There was a long time where the project people spoke a different language… The rest of the business did not have a clue what they were talking about. We are doing stats and volume testing next week. Big deal, I don't know what that is. See what I mean. And that was a huge problem, huge problem."*

However, this was a problem at the beginning of the project, while at the time of the interview it was seen as becoming less predominant as the communication on the project became more 'joined up', as an identified strength.

The IT consultant identified another weakness on the project related to communication across the project. The project streams did not discuss more technical system issues, such as integration between the different system modules. He stated in the chart:

> *"Different streams do not talk to each other on potential solution integration issues"*

Communication structure and process

The category named communication structure and process included the events or means put in place to ensure that communication about the project was taking place. Within this category, various formal events and processes were seen as strengths of project communication. These included so-called cathedral meetings and company conferences, existing communication channels, visible project posters and intranet site, and the procedures put in place to recognise key users.

The events included cathedral meetings, which were put in place to enable project communication. Additionally, company conferences were scheduled once a year. One of the users, for example, heard about the implementation project for the first time during one of these conferences. She commented on the conferences being a strength to the project communication:

> *"I thought it was a good way of communicating about [the project], I am not saying that presentations were necessarily great, but using the best opportunity when everybody is at a conference and talk about it I think is good…"*

She also added that the fact that the conference was taking place enabled them to find out more about project. They would not otherwise have the time to do that due to daily pressures on the job, although they knew where they could get the information and they might be interested in finding out more. She stated that:

> *"I know there is the monthly briefing pack in my inbox that I can have a look at, so I know it's there but I don't actively go and get the information. But if there is a conference or away-day and everybody is there, then we listen to it, we know what is happening. But we will not go... I will not actively go and seek information to know what it is all about. I am waiting for it to come to me. But it's more, it is not that we are not interested, it is just time and pressure 'cause I'd love to have more time to understand what is going on but it's just the time… find the time to do it, you know, we are so busy with the day-to-day job."*

In terms of the existing communication channels, the Transition Manager commented that the communications team already had an established network which facilitated communication across the company. He stated that:

> "This helps as they want to communicate messages across business units. Messages are about what is coming, when the things start, what to expect, it's got people that understand what they are trying to do."

Existing multiple communication channels were stated as a strength by the Project Manager. He stated as one of the strengths the fact that the communication channels were in place prior to the implementation project, which the project team could use. The company channels in existence were: the company magazine, intranet, regular briefings, senior management meetings, conferences. New communication channels did not have to be created especially for the project purposes. The project management had an opportunity to use what was in place already. They could just "*plug into it*".

Further means were put in place, which were seen by the end user as communication strengths. These were the "*eye-catching*" posters, as the end user described them, and the intranet site (Section 6.2.3).

In terms of further communication strengths, the activities of the key users have been included in the performance contract which is signed during the yearly appraisal and plan for the following year. The key user involvement has been officially recognised in this way, and the time they dedicate to the project. This has been stated as strength by a key user.

Additionally, the same key user observed a strength in using the key users in testing of the new system. There were two benefits from making the key users responsible for the system in this way: firstly, the key users needed to understand the details of the part of the system they were responsible for, and secondly, they needed to be satisfied that the system performed as they wanted it to in order to sign it off. She expressed this as follows:

> "Another strength is to use the super users in testing. So it is a really good way of getting to grips with the system, almost forcing people to go into the system and to understand it from the outset."

> "You are being forced to sign off that testing, you have to make sure you are happy with it. So it is a really good way of handing over responsibility."

One of the perceived weaknesses related to communication structure and process was expressed by an end user to be too much reliance on posters, email and intranet. This was seen as insufficient means by which to communicate information, as it is passive and people do not actively go to seek information where it is located. During her interview, she stated:

> "Maybe it's a wrong assessment, but to me the weakness is if people think that having posters, email, intranet there available is enough, then I think that's wrong 'cause I don't think that's enough. Or not necessarily that it's not enough but it doesn't mean that people will get information there. So I don't know how many people read posters, do go to the intranet site to check information, but I doubt there will be loads."

In addition, this end user identified that this information might not be relevant to the readers and might not directly affect them. In this case, they would not be interested in reading it. They would wait for the relevant information that would affect them to 'come' to them directly. She stated:

> "We don't go there to get information, we are sort of waiting for the important thing to come to us whatever is going to affect us because we don't want to know something that is not going to affect us. All these bits, most of us feel, well, that's fine, somebody is looking after that. When it's gonna affect me, then I would like to know what's gonna happen. Otherwise no."

However, she was unsure whether or not the project team was using these means of communicating as the main communication channel. In the event that the emails, posters and intranet were used as additional channels of information, the end user commented that that would be acceptable. On the other hand, if the team were using these as the main means by which to communicate to the rest of the business, she thought that they would not work, as people were not receptive to it.

One of the opportunities within the communication structure and process group was seen to be to get more face-to-face update meetings. An end user who identified this as an opportunity stated that:

> "I think face-to-face either via little meetings or via away-days or conferences, is gonna work much better [than posters and emails], so that's the way to communicate."

What was seen to be a threat to communication on the project was that there was too much communication flowing through the company and that some would be more important to the employees. The Project Manager identified this as a threat and saw the possibility of project communication being lost in other, more significant information. He stated:

> "It is more about the importance and relevance of the communication to people's everyday life. So for example we're now in February and year end is at the end of March. Communication around achievability of our year end targets is much more personalised in people's minds than communication around this project because it impacts on their bonuses, impacts on their appraisal, impacts on their pay rises. So it is more at employees' level: how do we make our communication heard, because if there is something shouting much louder than us, we may just get lost somewhere."

Facilitators

The group termed facilitators related to the strengths, weaknesses, threats and opportunities to communication during the implementation project, in connection with specific people or groups of people, or in terms of human resources selected by the interview participants.

Strengths

One of the strengths of communication on the project was seen to be the existence of the Communications Manager, which was identified by both the Project Manager and the Transition Manager. Considering that the person in the position of Communications Manager was accepted for another role to start within one month of the data collection

point, the Project Manager was asked if the role of the Communications Manager was necessary for the project. He commented:

> *"I think it is at the moment. I think it is at the moment purely because not everybody on the project is good at communication. Communication is one of the things that was forgotten about, the communication outside of the project. So at the moment we definitely need those skills."*

When talking about the role that the Communication Manager plays in the team, the Project Manager commented that the role would have been different if the Business Implementation Managers had taken communication activities on themselves. However, when he left the previous position on the project as a communication link between the project and the business and became a Project Manager, the role was not filled for some considerable time. This affected the communication between the project team and the business. He stated:

> *"Where that [the communication between the project and the business, due to the Business Implementation Managers] is working, the role of the Comms Manager is more about coordination and sharing the best practice as opposed to establishing communication channels and making it happen. I think it may be essential for us but I don't think having that position at the moment is necessary if we get these parts working right."*

The Transition Manager identified the existence of the Business Implementation Managers within the headquarters and the UK sales branch of the company to be one of the strengths to project communication.

Additionally, the Head of Marketing [HoM] was seen to be contributing to the strength of the project communication as seen by the key user from the Marketing Department. She stated that communication had recently stated filtering through to the end users in the Marketing Department through the HoM, and that they got regular email updates about the project.

Weaknesses

The weaknesses seen to be related to the facilitators of communication during the project were related to communication materials, the involvement of the Strategic Profit Centres, and the lack of resources. The Transition Manager recognised as a weakness the lack of resources with the skill to transform the material developed for end users into material that was suited for the end users within a particular department. He stated during the interview:

> *"We've got comms people in the business doing comms roles. What we haven't got are the grass roots people, end users or super users who I would like to help build comms material for their particular work area. So whilst we've got people that I can push material to distribute I don't have…[inaudible]… that would create nice stuff for my particular super user group… 'cause the more people you've got, not creating fancy material, but things that are particularly modified for that group, not generic. That's the problem, that's the weakness."*

In terms of the lack of resources within the business, the IT consultant identified the weakness in not having "*correct business resource against certain job roles*". The lack of the involvement of the right people from the business would make the build of the

system impossible as the consultants who were brought in externally did not understand or know the business and how it operated well enough to be able to create the system by themselves. He stated:

> *"Quite early on I am going to require the right business resources in the right roles, so consequently we are trying to go through a period of solution in time, so how do you become the architect of the solution without knowing the business without knowing what the target system could or could not do."*

The involvement of the Strategic Profit Centres was stated as one of the weaknesses by the Transition Manager. This was seen as a weakness, as the communication with the Centres was seen to be only one way at the time of data collection.

Opportunities

Several opportunities were grouped under the heading of facilitators of communication during the project. The Project Manager identified the engagement of senior management as one of these. The support had previously been 'patchy' and fell below the level of detail that was needed. Additionally, the fact that the Project Manager did not have direct authority over the people in the business was a problem in getting things done. However, at the time of data collection, the senior management became more involved, and this had an effect on communication. He stated:

> *"I may say something to somebody and they might understand it but they might not care because I've got no influence over their pay rise, I've got no influence over their career, they might not like me, they might not respect me, I don't know, but anyway, the impact of when I communicate with somebody might not be fantastic. Getting the senior management engaged gives us much broader base of people to communicate back in the business, so the Director of Finance communicates to the Finance team and us giving the communication to execs team can be much more powerful. So it is a real opportunity now that we are getting more and more engagement from the senior management to use those people in communication."*

However, getting the senior management on board was not simple. The Project Manager stated that:

> *"It is a long process. And a difficult process. It really came out of when the project was getting in the problems last year."*

At the time when the project was going through a crisis, the management had a series of meetings about how failure, should it occur, would impact the company. One of the problems that the project had was that more finances were needed to support the continuation. As the approval for the finances was cleared at the group executive level, the Project Management had a dialogue established at that level. The executives required more information to give them confidence that the project would succeed. One of the outcomes was that they became more involved with helping to influence the senior management within the company itself.

Once the company senior management got involved, they needed to know enough about the project to be able to perform efficiently. There was a series of communication activities to enable them to be efficient as project stakeholders. The Project Manager stated:

"...so there was the whole series of communication activities to educate them so they know they can talk with authority about the project and they can know where the best place is for them to get involved etc. etc. by holding their hand a little bit ...."

Another opportunity seen here was related to the strength of the Head of the Department becoming more involved in the communication process. This was identified by the key user.

A further two opportunities in this group were identified by the other key user, one being the more effective use of key users, and the other linked with the communication methods and key users from the enterprise system implementation project in the other part of the group. More involvement from the key users could have included the key users being trained and then delivering training to others. Another opportunity as seen by this key user was to link more closely with a similar project in the other part of the group in terms of methods and key users. However, when this was discussed during the workshop with the Business Implementation Managers, the Communications Manager and the Transition Manager, their opinion was that there was too much resistance to 'copying' anybody else, and that the people in Healthco would have wanted to preserve their own company identity.

Finally, the involvement of everybody in the new process was seen as one of the opportunities by an end user, in that way making the departmental team more efficient once the system was in place. Many people within the department were already involved in various stages of the system implementation, so when the system was fully implemented, this would facilitate the functioning of the department, as there would be no uploading of the data from the different versions of SAP systems between the other company in the group and their own system. The new system should streamline the processes for the department.

Threats

Issues, such as wrong people in the wrong role, partial hearing by the responsible people from the business, and the loss of the Communications Manager, were seen to be threats to the communication during the project which were classed under the same group named facilitators.

The IT consultant saw it as a threat to the project if the wrong people were in the wrong role as this ultimately results in a bad delivery. This threat links back to the weakness of not having the right business resource in the right roles. The consultant classified it as a threat as he was not sure whether to classify it as an opportunity or a threat. It implies that if the wrong people were in the wrong roles, the consultants would still not get sufficient or correct information to build the system, and this would then result in bad delivery.

The other threat also identified by the IT consultant was that some of the people with responsibility for delivery who were the business points of contact to the consultants did not listen to serious concerns about risks or issues that could affect the delivery of the system. However, the issue that he identified as being crucial was the 'loss of face' by the person in charge in the event of the delivery of a particular phase or step within the project not going well. So, according to the IT consultant, for this reason they

ignored the facts as delivered by him and only recognised the danger when it was already late. He stated:

> *"A threat is that people do not listen to reasoned arguments on risks or issues to solution delivery. You tell someone three times why something can't be done or what the threat is for the delivery date, and they choose to ignore it, because it is not what they want to hear. These guys have to report back to the program to say "oh yeah its fine its all coming on time" and when you give him the reasoned argument and why it is not going to happen they don't want to hear it, so they ignore it. And quite often they come back to you and say this is supposed to be on such and such a date. Why is it not? I'd say go back to my email or our discussion from three weeks ago and there is a reason why it is not going to happen."*

Finally, the loss of the Communications Manager was identified by the Transitions Manager as a threat, as it would take long time to replace her knowledge, contacts and network. The network of the communications team helps the consultants and the project management to communicate messages across business units. Messages could be about what was coming, when events would start, and what to expect. However, when the person with these contacts in the business leaves, it is not possible to replace them, primarily because it takes a considerable amount of time to build a network of that nature, and because no-one would take a position in the last few months of the project when the go-live and end of project involvement or contract are close.

One of the reasons that the Communications Manager was leaving the project was due to the fact that the project was scheduled to finish at a particular time and there was no continuation of employment for her, as well as some other project team members. However, the system go-live was postponed, which meant that the Communications Manager and others who had found other positions would not be employed in the final few months of the project. Those employees had to look elsewhere for further employment prior to involvement termination, either internally on another project, or for a permanent position, or externally. The Transition Manager commented on this:

> *"Programme comes to an end and people don't know what's gonna happen to them."*

But, according to him, as it got closer to the finishing time of the project, people started to look for another position in order to secure a future job. In relation to the loss of the Communications Manager, he stated:

> *"Time and time again, when it is most critical to keep people towards go-live, people can become very unsettled that the business has forgotten them."*

Unclassified

Several of the weaknesses, opportunities and threats were not classified into the groups which were created. These were related to the communication and involvement of the Strategic Profit Centres abroad, which was the next release of the system and as such was not the focus of this research, as well as some issues which were not directly related to communication on the project. For example, one of the end users identified as a threat the fact that the project would be costly, while the IT consultant identified that the technical staff from the consultancy would have the opportunity to be cross-skilled.

6.2.4.3 Communication successes and barriers

6.2.4.3.1   Communication events

The interviewees identified the communication events as significant, either as communication successes or communication barriers. Based on the classifications from the previous case study (Section 6.1.4.1) and the SWOT data analysis (Section 6.2.4.2), several categories were used. These were:

- Strategy

- Management activities, such as planning and announcements

- Motivation

- Knowledge:

     o   Bigger picture

- Communication across the project

- Communication structure and process

- Facilitators

Table 12 presents the communication successes and barriers as seen by the interviewees and categorised in the above mentioned groups with the number of occurrences. The successes and barriers are explained in more detail in the following text.

Communication Event	Category	No of occ.
[Company] Executives' engagement	Strategy	1
Announcement of delay to go-live for [Project] Release 1 Financial implications of the announcement of a delay to project timescales Time and cost	Management	3
Desire to communicate. Variety of methods used. Used outgoing people to communicate, e.g. the Project Manager	Motivation [Communication structure] [Facilitators]	1
Awareness of the programme	Knowledge/ Bigger picture	1
Ability to communicate complex issues in an understandable way Lack of understanding Didn't know if communication was working. Didn't know what people wanted.	Communication across the project	3

Communication Event	Category	No of occ.
Visual communication of progress to functional acceptance testing [FAT] plan Headquarters finance away-day with [Project] morning Sep '04 NPD and Marketing away-day in May '04 at [name] Hall Location – separate building Physical – [project] team in different building to teams SAP is going to affect	Communication structure	5
Lack of Business Implementation Manager in Centre People are becoming more involved in the project now relative to four months ago	Facilitators	2

Table 12: The summary of communication events according to categories [from interview charts with some extended for clarity and some changed to protect the privacy]

Strategy

Within the strategy category, only one communication success was classed. This communication success was related to the executives' engagement in the project and was identified by the Project Manager. The reasons leading to this success were the involvement of Healthgroup, and the pressure they were exerting on the company executives, planning to get the executives involved, and a series of communication activities in order to enable their involvement.

The actions taken to follow up this communication event were that a company executive steering group was created, the Managing Director communicated to the head office, and the education workshops took place to educate the executives about the project. The outcomes were their involvement in removing roadblocks; resources – people, were allocated to the project; and there were discussions with company executive teams and involvement on people issues such as people returning to the business following the termination of the project. Further information about executive involvement is covered in the section on Facilitators in 6.2.4.2.

Management

Three communication successes and barriers were classed in the management category. These included the announcement of the delay of the go-live date which was seen as a success, the financial implications of the announcement of the project delay, and the time and cost of communication activities, which were both seen as barriers to communication.

Communication success relating to the announcement in January '05 of the delay to go-live from the end of April '05 to the end of May '05 was identified by the IT consultant. He saw this as a success as it allowed more realistic deadlines and no 'corner-cutting'. He commented:

"If they hadn't announced it when they did, then we would have been working towards the original timescale and would therefore have rushed the delivery and that would have an effect on the quality."

The reasons for this success were that the business was not ready for the original go-live date but there was still enough time to rectify the project plan, and the fact that the solution was being redesigned. The action following from that was major re-planning across all streams, and the outcome was a new and more realistic go-live date for project Release 1.

In terms of the financial implications of the announcement of a delay to project timescales, this was also identified by the IT consultant. He saw it as a barrier to communication as the people in charge were afraid to announce any delays as they would be held accountable and *"heads would roll"*, although it was known why the deadlines had moved, and there were legitimate reasons for that. When asked about what it was that made this a communication barrier, the consultant commented:

"I think it is fear. Fear of being seen, must be seen as partially your fault if you are not telling the right people the right things at the right time that is obviously gonna have to become … as people don't want to be seen as the bad guy…"

The actions taken from this event were that the project stakeholders were given enough information to make informed decisions on changes to project status. One of the outcomes was seen to be organisation changes at programme level in terms of the changes of the people involved in the project, such as team members, team leaders and the Project Manager. The other outcome was that the re-planning provided more achievable project targets.

Another barrier to communication was seen by an end user to be the time and cost necessary to communicate. The reason for this being a barrier was due to the need to run the business on the company level and a day-to-day job on the employee level. The results from this were seen to be feeling out of the loop and missing out on key information. The perception of the end user of an outcome was that the results then affected their readiness to move to the new system.

Motivation

One of the successes identified by a key user was a mixture of issues that could be differently classified. This primarily related to the desire of the project team to communicate, which could be classed as motivation, in a similar manner as in Section 6.2.4.2. However, the interviewee then added that due to the desire they had to communicate, a variety of methods were used 'to get it right' [communication structure] and the people responsible for communication were the people who were outgoing and capable of communicating successfully [facilitators]. She commented:

"There is nothing scary about [the Project Manager] at all, he is very engaging."

Also:

"We chose the people to do communicating carefully, approachable people."

Regarding the reason why this was a success, she stated:

"We had all the tools to do it, we've had the desire to do it, we had the people to do it, we had the right sorts of people, right at the beginning I think we've had acceptance from people."

The reason for this communication success was that they learnt from the previous IT system implementation project, which was not successfully completed, that they had to communicate in order to complete the project. As a result of this success, the key user identified that the team *"did lots of communicating"*, that the appropriate people were chosen, and that a variety of methods were used throughout the project. However, as the outcome, she identified that there was too much irrelevant communication, which meant that the people lost interest. She stated that:

"It would have been great if it had left an appetite for more information, if people had been left wanting more. But it didn't actually. 'Cause I think people got just put off by it."

The reason for this was identified to be the timing of communication. She believed that it started too early, before there was anything tangible to show to the end users.

Knowledge – bigger picture

Another issue which was identified as a communication success was the business' awareness of the programme, which can be classified in the knowledge and awareness of the bigger picture category. This was identified by the Programme Manager, who stated that the quantity of communication was the cause of this success, as well as the level of seniority from which the messages came. However, considering that at the stage of data collection the communication about training was just happening, he recognised that the period was too early to be certain that the communication about training was a success, although he had every confidence that it would be. The final outcome was seen to be readiness and willingness to get involved and to change.

Communication across the project

Within the category of communication across the project were the in/ability to communicate complex issues in an understandable way, which was seen as a barrier; lack of understanding, which was seen as a barrier; and lack of awareness if the communication across the project was working.

The first communication barrier in this category was identified by the Project Manager, who gave three reasons for the team's inability to communicate complex issues to the rest of the business: different language, experts in specific areas, and engagement. He stated that:

"There's many ways you can describe a functionality within SAP, and 90% of them is not understandable."

As follow-up actions, he identified greater involvement on the part of the Business Implementation Managers; more creative ways of communicating, including using the name for the project with the slogan and the charts on the walls, which helped people to understand where they were, as well as making it easier to put pressure on people as the activities were more visible; and 'making it simple'. The final outcome was seen to be the business buy-in and success in implementation.

The Programme Manager also identified a lack of understanding as being a barrier to communication. He stated the same reason as the Project Manager to be the different language of the people involved in the project. He commented:

> *"So for me to go to this company board and start talking about "We need more resource for CMC preparation" they will look at me as if I am speaking Chinese. They don't know what I mean, I might be speaking,… it is just useless."*

The action was to involve the people who understood the business and to give *"less weight to the techies"* in the programme. The outcome was seen to be the use of simple language and a better understanding what the needs were.

Finally, lack of awareness and uncertainty if the communication across the project was working, was seen as a barrier to communication by the key user. The key user was uncertain as to the causes of this barrier to communication. She was not sure whether the people in the business were asked, and even if they were, whether the project team had enough information to tell the people from the business what they might have wanted to know. She stated:

> *"And I am saying this - I didn't know what people wanted, but I don't know if it is true. Maybe people did know what people wanted but maybe they could not give it to them. "I don't want you to talk about this, I just want to know how it is gonna change my day." Maybe we could not give that information."*

The actions taken as a follow-up from this were that the people from the business were asked what they wanted and whether the communication was working, but the key user was unsure as to whether the project team answered due to their inability to answer. She linked the team's inability to answer to the fact that the project was too big to know everything in detail. She stated:

> *"If you say to me my job is going to change, I would just say to you, how? I think people probably have asked that but I don't know if we were able to give an answer, and I don't know why that is. It is such a huge project."*

Additionally, the amount of communication was reduced and became more targeted, concise and more formal. The outcomes were that the information was provided to the business in small pieces, some of the jargon was lost, and people were not *"drowning in information"*. One of the outcomes stated but not written was:

> *"Big sigh of relief!"*

Communication structure

Five successes and barriers to communication relating to communication structure were identified as: visual communication of progress to the testing plan, departmental away-days and location of the project team as opposed to the rest of the business.

Visual communication of progress to the functional acceptance testing [FAT] plan was seen as a communication success by the Transition Manager. The reason for this was that it was clear to the programme management that progress was poor but, according to him, it was not clear that all the individuals involved were aware or taking responsibility. The result of this communication was that the testing was back on track and the outcomes were that the individuals were more aware and took ownership, so this was not the main concern of the programme.

Two departmental away-days were seen as communication successes by a key user and an end user. A key user saw the causes for the away-day to be recognition that departmental teams were not as involved in the implementation project as they should be, it was seen as a *"means of kick-starting better engagement"* and it provided a forum for the departmental team to ask questions and raise concerns. She stated:

> *"It actually worked really well….and I think it was just useful to get all the worries out of most of them."*

She stated that before the away-day there were some concerns recognised in the business, but mainly through informal networks:

> *"We sensed on the project that in a few areas there were some concerns mumbling, and no way to bring it out in the open, to resolve it."*

They found out about these concerns:

> *"Just through the informal network so having lunch with somebody who sits next to somebody who was complaining… just the feeling that not everything was quite right."*

During the away-day, they had half-hour round table sessions with someone from the project team leading the session. They talked about what the changes were more specifically, and people took part in the sessions that interested them. Questions were then put on post-it notes and stuck to boards to be assigned to a project team member to answer them. This was also seen as a result of the event, as well as people being given 'walk throughs' when requested. The outcomes were identified to be more clarity about questions that people had, and the allaying of fears:

> *"People were worried about things that weren't actually happening."*

Another outcome was identified to be that the departmental team became more involved, which led to involvement in testing of reports and increased general knowledge about the project and *"what [the project] was and what it wasn't."*

An end user identified the same type of event – an away-day, which was organised for her department. The cause for it in this case was that they had asked specifically what they wanted - how it was going to affect them and the department. The result of this event was seen to be the speech from the heads of departments which had not been planned, but was well received and addressed the participants' issues. The end user commented:

> *"That was the first time that we were told about what effect it would have."*

As the outcome of the event they felt relieved and reassured about the changes that would be brought about by the new system.

Finally, the location of the project team, as opposed to the rest of the company which would be using the system, was seen as a barrier to communication by a key user and an end user.

The key user identified the causes for this to be a communication barrier as it meant that informal communication and updating were difficult, so each meeting - even if informal - needed to be scheduled through a formal email invitation and a time had to be booked for it. Additionally, there was a lack of day-to-day involvement in the programme. She also suggested:

"I suppose it is more psychological than anything else."

The results of this barrier were that the project was *"easy to ignore"* and to *"prioritise the day job over it"*, as well as what she called *"us vs. them"* attitude. The outcomes were that the project team was stand-alone for a long time, without the day-to-day input from the business teams which was required to achieve the best solution, and that decisions were made which might not have been *"100% acceptable to business teams"* due to lack of business involvement.

The end user also identified the location of the project team in a different building from the location of the teams that the enterprise system was going to affect as a barrier to communication. She stated the reason for this as being a lack of space. However, as a result of the situation she stated that once the enterprise system was implemented, personnel from the project would be reinstated in their old teams and would sit together with the rest of the team. As an outcome she wrote that it would not be a long-term problem.

Facilitators

Two successes and barriers to communication relating to facilitators were identified by the interviewees. The lack of a Business Implementation Manager in the HQ of the company was seen as a barrier to communication by the Transition Manager, and people becoming more involved in the project at the time of data collection compared to four months prior to the project was identified as a success by an end user.

The lack of the Business Implementation Manager was seen as a barrier to communication as there were no links with the business in place. Consultants – external parties - were in transition roles, but a single point of contact from the business to the network was missing. This problem was addressed by appointing a respected Business Implementation Manager after the position had been vacant for two months, who had strong relationships and experience with the business area. The fact that the new person was respected was seen as important by the Transition Manager. He commented:

> *"You can't just put anybody into that role. For comms to work… not this change in particular but any change, it needs someone who knows the people to talk to, knows the stakeholders that need to decide. The consultant doesn't know who the real stakeholders are."*

In the meantime the project suffered due to consultants' lack of 'insider' knowledge of who was who. The Transition Manager pointed out:

> *"What you notice, you notice that it is hard work to try and talk to all the key business players, all the managers, yes, but it's difficult to get to talk to them. And you've got no single person to help you to get them all on the side to pull it from the business for you. So it's just hard work."*

The outcome of this action was the noticeable energy and pull from the business.

People from the business becoming more involved, and everyone being more aware of the project was seen as a success by the end user, who stated:

> *"Everyone knows it is happening and I think now it is becoming success and the people are becoming more involved. I think earlier on, certainly back in*

September, people didn't know as much about it as they do now. So I think it's improving and people are feeling a part of it."

People were asked to test systems, they were invited to training sessions, and their opinion was sought, which resulted in more involvement. As a result of this the end user expected that people would have more understanding of the systems. In terms of the final outcome, she expected the systems to be more efficient.

6.2.4.3.2   Causes for communication successes and barriers

Causes for significant communication events were classified into categories according to the theme of the cause. A number of categories were used from previous classifications, including from Section 6.1.4.2 on causes of communication events in the SME case, from Section 6.2.4.2 on SWOT issues, and Section 6.2.4.3.1 on communication successes and failures.

Table 13 shows the classification of the causes of communication successes and barriers in different categories, and the number of occurrences. The categories that were used here are:

- Strategy
- Management activities, such as planning and announcements
- Resources
- Knowledge:
    - o Detailed, individual picture
    - o Bigger picture
- Communication across the project
- Communication structure and process
- Facilitators
- Technical

All of the causes were addressed previously in the context of the chain of events.

Cause for communication success or barrier	Category	No of occ.
Healthgroup -> Pressure/involvement Planning to get them involved	Strategy	1
Clear to programme management that progress poor <u>BUT</u> not clear that all individuals involved were aware or taking responsibility Recognition that Head Quarters Finance teams were not as involved in [the project] as they should be	Management	2

Cause for communication success or barrier	Category	No of occ.
Need to run the business Day-to-day job Not enough space?!	Resources	3
Expert in specific areas Learnt from the past that we had to communicate Don't know if we asked	Knowledge/ Bigger picture	3
Don't know if we could have told people what they wanted Because we've asked specifically what we wanted: how is it going to affect us and the department	Knowledge/ individual	2
Different language Different language No business links in place. Consultants in transition role/s BUT no single point of contact from Healthco to network	Communication across the project	3
Series of comms activities to enable the executives to get involved Engagement [of experts to try to communicate issues in a non-technical manner] Quantity of communication Means of kick-starting better engagement Forum for Head Quarters team to raise Qs/concerns Meant informal communication/catch up was difficult Lack of day-to-day involvement in the programme	Communication structure	7
People are going to be held accountable for project status – "heads will roll"	Facilitators	1
Solution redesign Testing Training Opinions sought	Technical	4

Table 13: The summary of causes for communication events according to categories [from interview charts, with some extended for clarity and some changed to protect the privacy of individuals]

The involvement of the executives from the Healthgroup to engage Healthco executives was classed as being related to the strategy of the project as it reflected the way in which the project management went about the problems on the project that appeared at the time.

The management category has two causes classed. The first cause refers to the project lagging behind the schedule and the management awareness of that. This could have been classed under the category of knowledge, but in this case it refers specifically to knowledge of the management team about project matters, and as such could not be allocated to any of the existing knowledge categories. Again, in the next cause related to the Finance team's lack of involvement, it was the project management that recognised it.

Within the resources category, other priorities from the business and individual employee point of view were classed, as well as the lack of space within the same building.

Three causes were classed within the knowledge category relating to the bigger picture. These included: the expert in specific areas, which relates to the ability of the expert to put himself or herself in the position of the non-expert; learning of the project team from the past about the importance of communication; and the lack of knowledge relating to gathering information about asking the end users what they needed to know. Regarding the expert in a specific area, the Project Manager commented:

> *"We have a lot of experts in specific areas in the project. What that means is we also therefore have a lot of people who don't understand a lot of parts of the project, and it's always very hard for somebody who is expert in something to explain successfully and quickly to people who know nothing about it."*

Two of the causes were classed in the category of knowledge relating to the individual specific picture, rather than bigger picture. One of the causes relates to the lack of knowledge of the project team [key user] if they had sufficient information which was individual-specific to pass on to the end users. The other cause relates to the end users requesting individual-specific information as they did not have it.

Communication across the project was allocated three causes, two of them being different language, which in fact relates to the content of communication and the way in which communication was done. The third cause relates to the lack of business links between the consultants and the business, which would enable communication across the project.

The communication structure category claimed seven causes. It included: creating communication activities for the executives to be educated about the project so that they could help the project team; engagement of experts to communicate technical issues in a non-technical way; quantity of communication from the project team and the executives to the users; means of kick-starting better engagement of a department; a forum for the departmental team to communicate with the project team; as a cause of a barrier, lack of communication structure, which made informal communication difficult; and lack of day-to-day involvement, which meant that there was no structure in place to enable communication which would have otherwise happened on a daily basis.

One cause was allocated to the facilitators group. It relates to the people who were preventing the flow of information, and thus communication, as they were worried, according to perception of the interviewee, that they would be held accountable for the project delay. In this case, these people were the opposite of facilitators, and could be called obstructers.

Finally, the technical category included four causes: some purely technical, such as solution redesign, and some related to more interactive activities between the users and the system, such as training, testing and seeking opinions about the expected functionalities of the system.

6.2.4.4 Employee concerns about changes

Overall, the changes on a company level were identified to be related to the increased efficiency and eventual reduction in staff numbers over a period of time. Of the employees interviewed, the Project Manager, the IT consultant and the Transition Manager identified that there would be some job cuts, at a later stage. However, the first two mentioned that this had not been clearly communicated to the staff. One of the end users also speculated that there might be some changes in the number of personnel, as she knew of people taking voluntary redundancy, but she did not think this would affect her. Another concern was of the sheer size of the change and the fact that the change was happening over a very short period. Concerns over the timing of the coaching of the people who would be affected by the changes were also raised. It was perceived by some of the interviewees that the go-live date was very close and that there had been nothing in place by the time of data collection.

Changes to day-to-day jobs were briefly covered in the company newsletter from September 2004, which published an interview with the Programme Manager. When asked about the changes in the employees' work, he replied that the change across the company would be big but that it would be "*relatively small*" for most of them. He stated that some roles would be different. Most employees would continue to do the same job, but it would be easier to do. He went on to describe the specific user interface changes, how data would be more accessible, and that the system would support them, the employees, better.

Again, in terms of changes on the employee level, the Project Manager identified that the system would give more responsibility and more accountability to the people. One reason for this was that it would be easier to identify where things went wrong. The IT consultant stated that the employees would be doing a very similar job but on a different platform. The Transition Manager described the changes as process changes that would affect employees' behaviour:

> "*A change in workflows, people will see a message coming, a workflow message, to say you need to action this,… or do something, … so people will be, not dependent on, but they will be prompted to do things in a way that they were never prompted to do things before. If they don't do them they will sit in their inbox and will be escalated in due course to their boss. That's a change cause if you don't check your workflow things will slow down.*"

The key user stated that she found out about the changes in her day-to-day job through her involvement on the project, rather than through communication from the project

team. The IT consultant stated that the specific job changes would be communicated through the external training.

The employees had been shown a change curve in an article in *People update* part of the company newsletter, in a section about the changes that they might expect to go through during the implementation project. The company newsletter published it in September 2004, after the changes in the project plan and team structure. Figure 6.3 shows the curve as it appeared in the newsletter, which is very similar to the aforementioned curve by Elizabeth Kübler-Ross (Figure 2.7). The Programme Manager commented on the curve in relation to the system making things more difficult for the company:

> *"I mean, you know, there is, you know very well I am sure, there is a curve, we've communicated that curve, but once we get through that which I think broadly is implementation, then I don't see downsides, no."*

Predictable reactions to change

Rewarding Completion
(Satisfaction)
This is the best bit, You've done it. You're realising all the benefits of the change. You're back on top!

Informed Optimism
(Confidence)
You've got it sorted. You know exactly what you're doing, when and how you're doing it and it feels good.

Uninformed Optimism
(Certainty)
You've just heard about the change and it sounds great!

Informed Pessimism (Doubt)
You've found out a bit more about what will need to happen or what you will need to do and you feel more pessimistic

Hopeful Realism
(Hope)
Your understanding has increased, maybe you've had a little training and feel more planned. You have started to see how you will achieve the change and you are feeling a bit more positive.

Rock Bottom
(Despair)
You know what the change is, understand the obstacles that you will need to overcome but don't know how to achieve them. It's too much! Not possible! You can't do it!

Optimism / Pessimism

Time

Figure 6.3: The change curve (Company newsletter, Sep 2004)

Overall, the concerns about job changes were related to specific areas. These were:

- employees would have to take time off from their normal work in order to attend training, and would also have to be more patient and be prepared to learn,

- employees who had worked in one way for many years might be more resistant to change,

- employees who would be using the system did not understand the extent of the changes, and that might affect others who did.

The Project Manager expressed his views on how the employees would react to the changes:

> *"There will be people who will embrace the change and there will be others who will see it as a big threat."*

When talking about the anxiety that the employees go through, the Transition Manager identified different phases of anxiety as the implementation project unfolded, based on his experience. He stated:

> *"But the total anxiety amongst the people on the programme, and it is a very stressful thing to go through and, I mean I've done it, but each time you go through, it's difficult for everybody not just for me, ...[...]...anxiety and this pain to get there and,... but then you do it..."*

However, none of the interviewees had concerns about changes to their own jobs.

Job changes were to be addressed by training. In general, there were no concerns relating to the employees' level of expertise, and it was thought that this would be sufficiently covered by the training. However, one of the interviewees, the IT consultant, was the only one who had serious concerns about the employees' level of expertise after the training. He could state a specific example of an individual still following an incorrect procedure even after the training.

All of the interviewees knew that there would be a permanent help-desk in place to support the users. Some identified the key user as the first point of contact, and then the line manager.

6.2.4.5 Commitment

With regard to the system supporting the company, there were different views. The Programme Director stressed the business benefit from system implementation, and how every department involved in the implementation had to calculate the financial benefits of the system in their respective departments. He stated:

> *"At the end of the day there is only one way and that is pound notes. And if you can't quantify it in pound notes we shouldn't be doing it."*

The Project Manager gave detailed explanations of the system supporting the company:

> *"...it will help individual parts of operation be more efficient and achieve growth targets. They will be more able to control some overheads. There will be greater visibility of information for better and faster decision making, so they will be able to better understand performance of parts of the business as the*

system will give the visibility of operations, all the way down to individual sales rep and how he manages discounts for example."

However, he also mentioned the need for the 'silo mentality'[17] to be eradicated as there would be greater inter-departmental transaction. After the introduction of the system, everything undertaken on the system would be visible and so would be its effects on others in different departments.

Similarly to the Programme Manager, the Transition Manager identified the future growth and financial benefits. He stated:

"The company needs platform on which to grow to achieve targets and ambitions."

The IT consultant's view was in line with that of the Project Manager. He saw the system supporting the company in terms of bringing together the old and incompatible systems which were on different platforms, and providing visibility.

One of the key users saw the system as attractive, consistent, efficient, with one database and supporting the company in that way, while the other saw it as providing transparency of information and consistency, and speed of information exchange. An end user saw the system as providing better performance for the whole business via better systems within the organisation so that the work could be performed better and more efficiently. She stated:

"For me it's about reducing cost, reducing time we might use to find information, to get to data or information quicker and therefore overall work faster."

The other end user stated that the new system should support the company by reducing the need for data upload and download:

"...Systems should be able to talk to one another without the need for manual intervention."

In terms of the ways the system would hinder the company, the interviewees identified that any hindrance would be short term. The issues identified were:

- while the training was being given, the users would need to leave their jobs in order to attend,

- the users would need patience and preparedness for learning,

- the users would need to be prepared for the system not working efficiently at first,

- the period when the old system would be running in parallel with the new system,

- the ways of working at the beginning and the compliance would not be there,

- it would particularly affect people who had been in the same position for a long time and who would have to change their way of working overnight,

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[17] Silo mentality in practice assumes that one's own department is seen as being separate from the rest of the company and thus internal barriers between the departments are created.

- the steep learning curve for the new system would create pressure,

- more control would be needed due to wider access to information,

- making the work slower.

However, a long-term hindrance was seen to be related to the need for the data being put into the system to be correct. Should this not be done correctly there would be a bigger impact on the business than would have been the case when there was no enterprise system in place.

Related to the support of individuals' work, the system was seen by the interviewees to support the employees' day-to-day work by:

- providing one version of the truth and one set of data,

- allowing more autonomy, more easily available information, and quicker decision making,

- making their lives easer - the system would enable them to *"focus on value adding work and data interpretation"* [Project Manager],

- providing a better way of working for those who were willing to learn,

- streamlining current operations and giving the employees tools to do the job better,

- enabling them to *"delve deeper into budgets and risks"* [end user] and have greater access to information,

- some employees would not be affected if they did not use the legacy system in the past.

In terms of the system hindering employees' day-to-day work, this was seen to be only a short term effect while the employees were getting used to and familiarising themselves with the new system. This also relates to the system implementation taking the employees *"out of their comfort zone as they will have to develop skills to cope with the system so it might be scary for some people"* [Project Manager]. Additionally, they would need to be more rigorous with the data. During the implementation, it was considered that the system would make it more difficult for employees who were reluctant to make changes. In order to improve this, the IT consultant believed that *"the communication needs to come from the top, the right people need to explain the pros and cons and use it as a pitch"*. Another hindrance was seen to be the lack of all financial reports until the Strategic Profit Centres abroad went live. However, not all of them were planned to go-live or use the system at all, and consequentially, not all the data would be on the system and available for use by the rest of the company.

Commitment to the project did not appear to be a problem. Everyone who was involved seemed to have taken the project activities on board and accepted them. For example, the Programme Manager stated that once one became a Programme Director, total commitment was essential, and described how his commitment to the project had changed:

> *"I think at the very beginning, before I was involved I was probably nought % committed to it but I am the sort of person that I am rather committed or I am not going to do it. And once you become the Programme Director you got to do*

it. And which comes first I don't know. You can't have a Programme Director who is not committed to it."

On the other hand, a consultant has the full commitment to delivering the project to the company as a customer. The IT consultant stressed that his commitment was not specifically to the company, but to delivering the project successfully and to the consultancy that he was working for. He commented:

"[Consulting company] has a commitment to [Healthco] to deliver a particular programme. So I'm on subcontract from that initial contract and I see my responsibility as having to deliver to [Healthco] and that is really where my commitment lies."

On a more detailed level, the Transition Manager, himself a consultant, was committed to ensuring that the skills were present in the business to use the system appropriately.

"My motives are to try to make sure the right skills are in place."

One of the key users identified that her involvement on the project affected her commitment to the company, and she was enthusiastic about seeing the system working. The other key user was particularly interested in communicating her understanding of the system and learning from participating on the project. However, she felt that people were not interested as no-one asked any project related questions when she returned to the department.

6.2.4.6 Ownership

Finally, there were differences in perceptions of who was responsible for the execution of the project phases. The answers were:

- the project team with the consultants being responsible for the technical issues,
- the Programme Manager,
- the leadership team, as well as people in charge of specific tasks within the phase,
- the company and the consultants jointly,
- the Project Manager, his technical counterpart and the people underneath them,
- departmental representative working on the project team.

The responsibility for the system was perceived to be in the hands of the consultants to a great extent by most interviewees. The Programme Manager saw it as a responsibility of his technical counterpart on the programme level, the IT Director. The Project Manager saw this responsibility divided: prior to the go-live date it was his technical counterpart and himself, while after the project, it was the business, the IT Department and the help desk. The IT consultant saw the responsibility for the system to be in the hands of the business, the IT Department and the help desk.

The Programme Manager noted that the responsibility for the system design was incorporated into departmental budgets:

"The way the changes were designed they are all owned by the business. So the business has formed business teams which have scoped the changes and which have said if we do this we will save x, y, z % and we'll own that [...]so the sales

solution, the CRM solution for example was owned by a team of people who knew about sales, was designed by a team of people who knew about sales."

A key user also commented that handing over responsibility for testing by requesting a sign-off for the system by the department was good as it meant that the person signing the system off had to be satisfied with the design. She commented:

"You are being forced to sign off that testing, you have to make sure you are happy with it. So it is a really good way of handing over responsibility."

The responsibility for the system development was less clear among the interviewees. Some interviewees referred to the development process during the implementation and some after the go-live. It was seen to be either the responsibility of the consultants, of the IT Department and the executive steering group, beyond go-live, or of the IT Director and the Programme Manager jointly. The Programme Manager commented on who was responsible for the system development:

"[Information Systems and Technology Director]. Well sorry, system development falls into two bits. The design, the business and the technical solution. The distinction we made all the way through is I am responsible for the business. Which is the design, the delivery of the training, change readiness, and benefits delivery, and [Information Systems and Technology Director] is responsible for the technical solution behind all those things."

The Project Manager stated that there was a plan for a design council which would include people with business experience and technical skills and would be in charge of the further development of the system beyond the go-live.

6.2.4.7 Other themes: organisational structure, cohesion and trust

In this case there was a noticeable problem with the static and permanent organisational structure and the fluid and temporary project structure. This was also related to authority and the clash of who had it - the Project Manager or the functional manager. This issue was raised by the Project Manager who commented on the involvement of the senior management and how it was difficult to get things done as he did not have the influence on the person in terms of their pay rise and career, as well as not gaining their respect or liking. However, getting the functional managers on board meant that the communication from the functional management received more recognition as they had an impact on the careers and pay rises of the employees.

Another clash of organisational and project structure is presented in the example of executive management involvement. The group executive management got involved at the time when there were financial problems and one of the requirements from them was to influence the senior company management, to which project management did not have direct access. So the project management achieved influence on the functional management by going further up in the group level hierarchy, and then down to the functional management. Another issue related to the influence of the senior management concerned educating them about the project so that they could convey authority when they communicated to the business.

Relating to the hierarchical structure within the department, the position of the person involved in the project influences how much they will be heard. One of the key users commented that she did not receive any questions about the project from the rest of the

group when she came back from the secondment on the project. However, the Head of the Department becoming more involved in the communication process was seen as a positive move. Another end user commented that upon her return to the department from the secondment, the key user just continued with her normal day-to-day job, as if nothing had changed. However, the same key user thought that she was involving her departmental team, but through activities related to the project tasks rather than communication about the project. Key users also featured in providing an opportunity to become more involved and deliver the knowledge they had gained during their secondment.

The issue of the cohesion of departmental team is then raised when a person involved on the project arrives back into the team. How accepting can the departmental team be of the person with all new information that the rest of the team does not have?

The issue of trust is thus raised. The Programme Manager raised the issue of trust in the technical capabilities of the consultants. The company was seen as being vulnerable due to reliance on them to deliver the technical solution. When this issue was addressed during the workshop, the workshop participants stressed that the consulting company was in partnership with Healthco, almost as a "*joint venture*", rather than acting as a supplier. Not knowing who the comment came from, they speculated that it could be a communication problem as people did not understand that it was a partnership and a long term commitment on behalf of the consultancy and the company itself. Additionally, the project management has not communicated that there would be job losses in due course following the implementation. The employees, however, did not have concerns about job losses at that time. It could be drawn from this that either the employees trusted that the management was communicating whatever needed to be communicated about job losses, or that there was a certain amount of turning a blind eye to the fact that there could be losses.

6.3   Key findings from the case studies

Based on the two case studies, simple frameworks were developed in order to bind the data and make it easier to understand what was perceived to be important, successful and unsuccessful in project communication. Following the framework, the additional findings are presented, as well as the issues of ownership, commitment and anxiety.

6.3.1   Framework

The framework involved the findings under specific themes:

1. Strategy

- Communication regarding:
    - financing of the project
    - future requirements of the system
- Delivering financial benefits
- Joining communication between programme and business
- Final goal focussed communication, with clear objectives
- Significance of the project

- involving the executives from the group level to influence the company management

  2. Management activities, such as planning and announcements

- Project proposition meeting

  - o With project stakeholders/top management

  - o With company employees

- Announcement of the project initiation

- Announcement of the go-live delay and financial implications of the delay

- Time and cost related to communication

- Transparency of who is taking responsibility and being invovled

  3. Motivation

- Desire to communicate

- Time and people's involvement needed

  4. Resources

- Clash of priorities – day-to-day job and running the business

- Space for the project team

  5. Knowledge:

  a. Detailed, individual picture

- Having and communicating the information that people want

- Users asking specifically how the system is going to affect who and when

- Communication relevant to the users

- Communication about the next steps: training, date of the go-live etc.

  b. Bigger picture

- Communication about the details of the system design to key users

- Lack of awareness of the change management programme in relation to the system development

- Awareness of the business of the bigger picture gained through the quantity of communication and seniority of the source

- Gaining picture of areas not directly relevant through involvement of the experts

- Past learning about the importance of communication about large projects

- Lack of awareness if the users were asked what information they wanted

  c. Keeping informed

- Keeping the people not directly involved, e.g. end users and key users, informed of the changes

d. Technical issues

- Uncertainty about the system still changing late in the project
- Knowing what will happen if the system does not work

6. Communication across the project

- Communication events as a means of improving information flow and keeping people up to date, getting experts to explain technical things simply, in order for people to see the bigger picture
- Language used by the project team and its understanding within the business
- System integration communication across the project streams
- Awareness if communication was working
- Links with the business coming from the business rather than from consultants acting as links
- Targeted, concise and formal communication

7. Communication structure and process

- Regular project meetings of everyone involved
- Company conferences and away-days
- Making the most of communication channels already in existence
- Project posters and intranet site, but not as main means of communication
- Procedures in place to recognise key user involvement
- Face-to-face update meetings
- Competing communication 'drowning' relevant project information
- Location of the project team affecting the ease and formality of communication

8. Facilitators

- Engagement of senior management
- Out-going Project Manager
- Communications Manager
- Business Implementation Managers
- Heads of departments
- Key users and their involvement
- Involvement of the whole department in various stages of preparation for go-live
- Better connection between key users from different enterprise system implementation projects
- Resources to transform the generic project material in specific departments
- Resources who know the business sufficiently well to contribute to the system build

- Responsible people with selective hearing due to their accountability

   9. Technical

- Use of the dummy system to test and team cooperation as a result of that

- Training

- Verbal request regarding the needs and requirements from the system

- Dummy system and system installation

- Inability to use the old system for developing needs

- Solution redesign

- Testing

The significance of the findings within the framework is that they give an insight and understanding of what project participants find significant in communication during enterprise system implementation, what proved to be successful, and what proved to be a barrier if it was not present. Some of the aspects are described in the case study findings as strengths, weaknesses, opportunities or threats, and some are presented as processes occurring during the implementation.

6.3.2   Ownership, commitment and anxiety

Ownership

With regard to ownership, in the SME the transfer of ownership was seen to be from the System Developer to the management and from the management to the users. The transfer of ownership was seen to happen in the act of providing the requirements of the system, which once they were incorporated into the new system, signified the mark that the users had left on the system, and that users' needs were integral to the business, and would thus result in them feeling that they owned the system to a greater degree. Becoming familiar with the system before the go-live through the use of the dummy system and training was also seen to increase ownership of the system.

In the large company the responsibility or ownership was distinguished between the ownership of the execution of the project phases, ownership of the system, and ownership of the system development. The ownership of project phases was perceived to be the responsibility of everyone involved in the project. Different respondents gave answers appropriate to their level of involvement on the project. For example, the Programme Manager saw it as his responsibility, while the end user saw it as the responsibility of the departmental colleague on the project team. The responsibility for the system was seen to be in the hands of the business, the IT Department and the help-desk beyond the go-live date. In order to encourage the ownership of the system, the savings were incorporated into departmental budgets when the changes were scoped and the savings calculated. Additionally, the responsibility for signing off the system design was in the hands of the departments, which meant the person signing off the design needed to be satisfied with it. The responsibility for the system development was jointly shared between the executive steering group and the IT personnel and consultants. Beyond go-live, there were plans for a council comprised of people with business knowledge and technical skills. However, only the Project Manager was aware of this.

Commitment

The level of commitment in the SME was largely determined by the formal or informal contractual situations in which the parties were involved in order to achieve a certain agreement. This transpired from involvement of the top management, other companies in the consortium, the System Developer and the users. Top management and other companies in the consortium were investing into the system development and were allowed input into it; the System Developer commitment increased by having financial support to develop the system; and the commitment of the users increased as they were asked for contribution and felt valued. Training was not seen as affecting the level of commitment.

In the large company the system was seen to support company operations, making the company more efficient and able to achieve growth targets, and providing transparency of information. The hindrance that the system would cause to the company in the short term related to the users need for training and having to take time off work, needing to have patience with the new system, and being prepared to learn. Hindrance is in this case only addressed on an individual user level, rather than company level. In the long term, the only danger was seen to be the need for consistency and accuracy of the data which was put into the system. The system would support individuals' work by providing easier access to real-time information and allowing them to focus on value adding work, rather than spending time on manual conversions of data. The commitment to the project did not appear to be an issue. The Programme Manager perceived himself as being totally committed to it; the consultants were committed to delivering their part of the contractual obligation relating to their involvement in the company; and the key users perceived themselves as committed to the company through involvement in the project, keen to pass on the newly gained knowledge from this involvement, and to see the system work.

Anxiety

Considering that the change in the SME was evolutionary, and the system was a Windows version of the old system, the levels of anxiety among the users were not particularly high. Threats of job losses and company restructuring were not present. The only type of anxiety present was due to the new system use and the level of support to be provided by the System Developer. The former was addressed through the use of the dummy system for testing and training, which reduced anxiety levels and allowed familiarisation of the users, knowing that they could not damage the system or data. The latter was addressed through a meeting with top management where the users were reassured that there would be support in place both from the management and the System Developer.

Anxiety and concerns about change in the large company had many more facets. The change in the large company was revolutionary; a whole new system was being implemented, eventually the job cuts were envisaged; and the users had many more things to learn regarding the use of the new system. The changes were officially expected to be small on the individual level. However, the types of changes to employees' day-to-day jobs had not been communicated. The key users who knew about them were those involved in the project who learned from their involvement, rather than from the project team. The job cuts were expected eventually, when the skills of the employees were to be reassessed and compared against the requirements of

the position. This had not been communicated to the business. Everyone interviewed was confident that the training would build sufficient expertise in the users. However, the IT consultant had reservations about this being the case.

6.3.3 Additional findings: organisational structure, cohesion and trust

Key findings emerging from the case studies and relating to organisational structure can be described as the problems of different organisational structures and project team structures. In the SME the project team structure was the same as the organisational structure, whereas in the large company these were different.

Figure 6.4 shows the company and project team structure for the SME. Figure 6.5 shows the large company structure vs. the project team structure, where the programme management comes from the top management, the project managers are co-opted into the project and the key users come from the departments where the end users are still working on day-to-day running of business. The departmental managers are not directly involved on the project. The communication processes are thus very different in different sized companies. Whereas in an SME the communication channels are already established and they follow the line of authority, the temporary project in a large company needs to develop its own communication channels and make the most of the ones already existing.
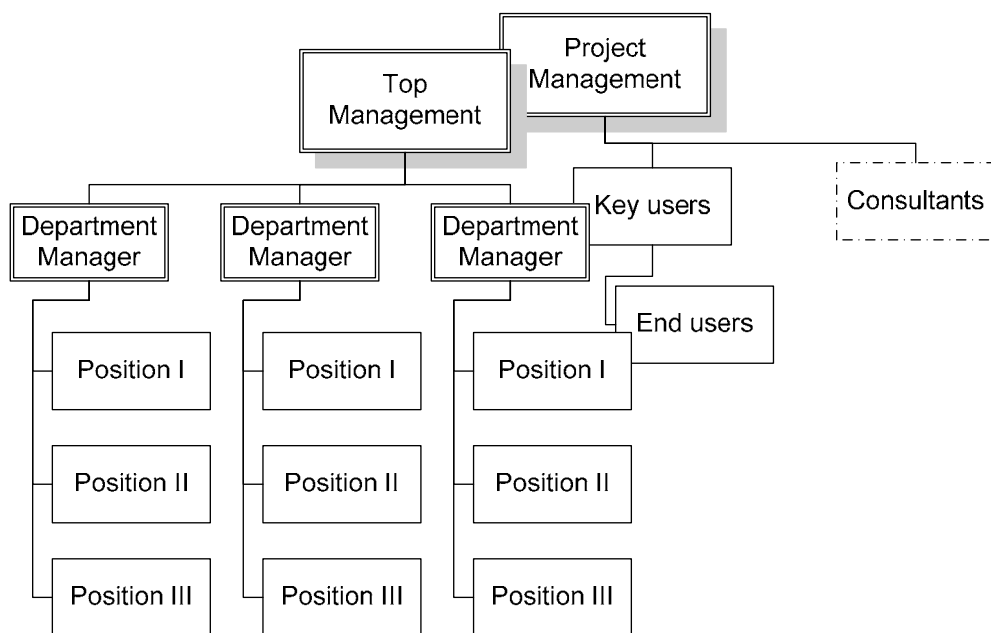
Figure 6.4: Company and project team structure, SME
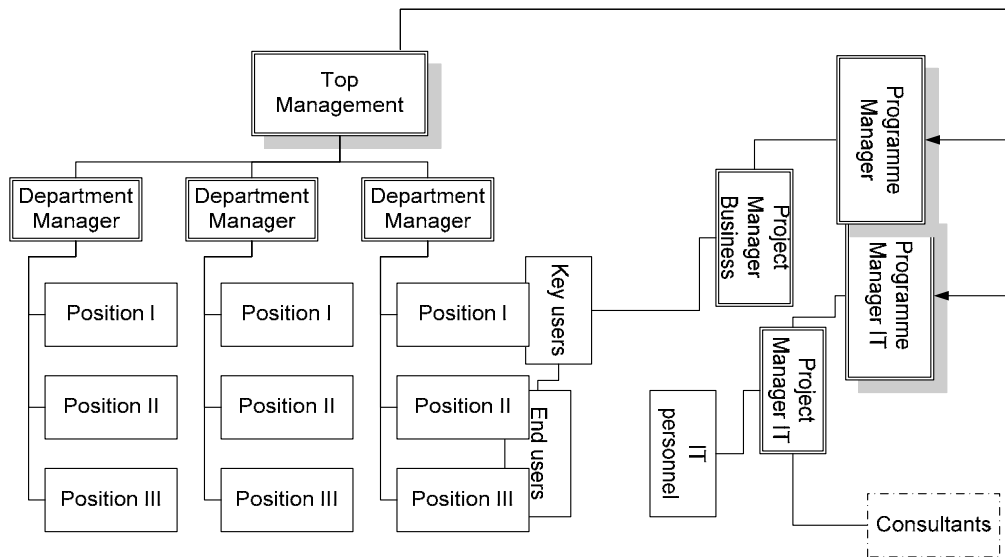
Figure 6.5: Company and project team structure, large organisation

The issues of team cohesion are more obvious in a small company as the users share the same activities with the system being a base and providing a structure for the activities to be performed. The users work together to understand the system. However, in a large company, a key user is taken out of departmental context, and co-opted into the project. When they return, the communication between them and the end users with regard to the system seizes up. They need to integrate into the department again, after having been an outsider for several months. Additionally, as the project structure is only temporary, once they are back into the original, permanent setting, their authority over users is diminished, and the only authority now is the official line of authority, the departmental manager. On the organisational level, so called silo mentality was identified among the departments in the large company, where each department was seen by the departmental members as being separate from the rest of the company. The enterprise system itself affected this by making the inter-departmental transactions more visible and thus allowing more cohesion within and between the 'silos'.

Trust throughout the process of change transpired to be significant. In the SME, trust in the management by the employees was present and obvious to both groups. However, in the large company, trust or lack thereof manifested in different ways. There was trust between the management and the consultants regarding the technical delivery of the system, and the trust of the employees in the management that they were well informed. Whereas the former was explicit, the latter was implied, and observed through the lack of anxiety or outright 'blanking out' of the possibility of job losses. Additionally, there was trust that the training would be sufficient to enable them to use the system.

6.4   Expert validation

6.4.1   Classification questions

In order to assess the validity of research in the second phase, two experts were chosen to take part. The purpose of engaging the experts with the validation process was to test the theoretical validity of research, according to Section 3.9. The focus was on the building blocks of the theory – the concepts. The questions asked were:

1. How are the building blocks – the concepts, made? Would different researchers create the same or similar categories? These questions consider the creation of concepts or categories based on data.

2. Are the boundaries between the concepts clear? Can data – communication events and causes for the events, be systematically categorised? These questions address the population of the categories with data.

3. Can different researchers categorise the same data in a similar way? This question addresses the repeatability of the classification process by different people.

4. How stringent do the instructions for classification process need to be in order to achieve theoretical validation? This question addresses to what extent the instructions for the categorisation process need to be directive to enable another researcher to classify data in the same way.

The questions above are presented in Figure 6.6.
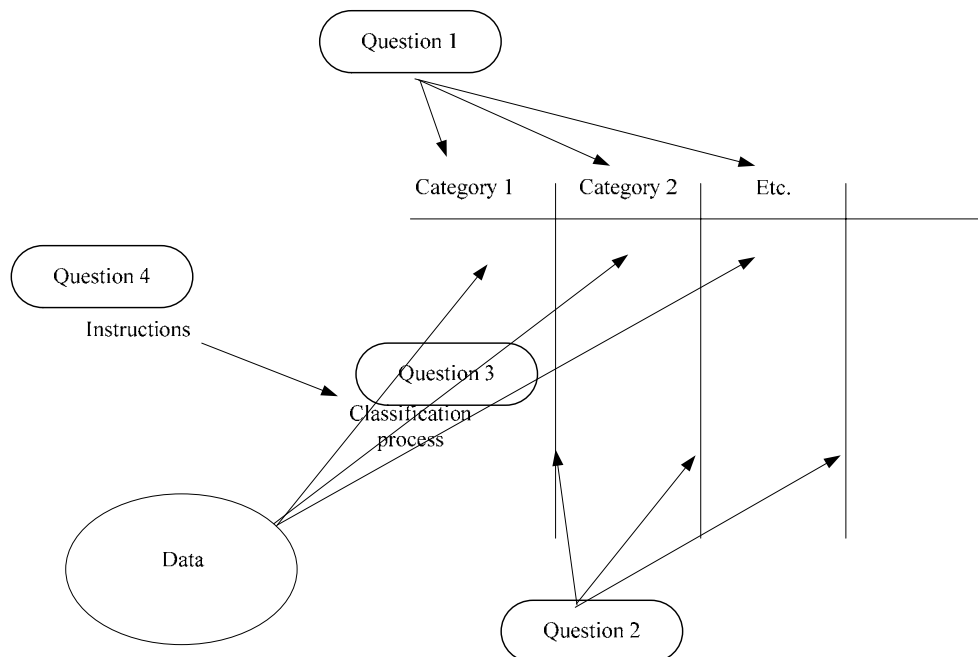
Figure 6.6: Questions relating to data classification and concept creation

Validation was divided into three parts, where the initial part involved one expert, while the instructions given were fairly broad. This part served to answer question 1,

and partially questions 2 and 4. Further validation involved another participant, while the instructions given were more directive. This part served to answer question 1, and partially questions 2 and 4. The final part involved the first expert, while the instructions were given to classify the data into the same categories as this author. This part of validation served to answer questions 2, 3 and 4. Details of the validation process and the findings from each of the validation parts are presented in Appendix G.

The expert involved in the initial and final part of validation was the same person who took part in the interview structure development (Section 4.2.6). She was an Enterprise Package Expert, who had had several years' technical experience of enterprise system implementation. The participant involved in the further part of validation had experience in research on stress levels of airline crew members and how this related to customer satisfaction.

6.4.2   The conclusions from the validation process

There are several conclusions that can be drawn from the validation process, which was conducted in order to answer questions in Section 6.4.1. Regarding question 1 about the creation of categories, the more open the instructions given to the researcher working on classification of data are, the more the categories will be based around the knowledge and experience of the researcher.

Regarding question 2 on the clarity of the boundaries between the categories, the more structured and directive the instructions are, the more opportunity there is to place any particular data into more than one category. When the researcher creates his or her own classification system, each piece of data is classified into only one category. The more directive the instructions are and the more the categorisation system coming externally is imposed, the more opportunity there is to see the data as being classified into different categories at the same time.

Question 3 related to classification of the data by different researchers into the same categories. In answer to this question, the classification depended on the point of view of the researcher classifying the data and their experience, as well as the understanding of the data itself.

Question 4 was regarding the instructions and how directive they need to be to enable the data to be classified in the same way. In order for other researchers to conduct the data classification, it is necessary to give clear and extensive instructions to enable them to obtain the broader perspective on the implementation process. Reading the full set of data would make this process more likely. However, even if this were done, the data that was classified in the table that the researchers were given was only an abstraction from the thinking process that the interviewee was going through at the time of the interview. The researcher classifying the data does not have the whole picture of the implementation process that the interviewer gained. One possibility to alleviate this problem would be if the researcher were to be given the interview notes to read as well as the tabulated data collated during the interviews.

It transpired from the validation of the coding that the creation of categories is a subjective process, based on the researcher's own experience and knowledge, and of their view of the world based on those two, and on their involvement in the data collection stage. As this research falls in the category of interpretive research, the

interpretation of data is dependent on the researcher and his or her understanding of the data.

In addition, for this process to be repeatable, it is necessary to make the thinking behind the creation of categories explicit in the instructions. Only in this way can other researchers understand and follow the instructions, which would be self-explanatory and sufficient for him or her to perform the coding.

6.5   Conclusion

In conclusion, the question remains regarding the meaning of the results presented in this chapter. The evidence is provided, the findings presented, the validation process completed. Chapter 7 builds on these findings and discusses their significance. It answers the research questions 3, 4 and 5, on the role of communication and the research method used, and additionally addresses issues that emerged from the data which were not specifically related to the research questions.

7 DISCUSSION

The main aim of this chapter is to discuss the research method used for this research, data collection and analysis method, and the findings. This is towards answering research questions 3, 4 and 5. The points raised here answer research questions related to:

- the ways in which the implementation process can be studied so that our understanding of the discrete communication processes occurring during the organisational preparation for the go-live can be furthered (Chapter 3);

- the ways in which communication within the project team and between the team, the project management, top management and end users affects an enterprise system implementation process, especially in terms of employee commitment, concerns about change and transfer of ownership from the top management to the end users.

Additionally, the issues that emerged from the data which were not specifically related to the research questions are discussed here.

7.1 Research method

From the very beginning of this research, a qualitative research approach was adopted in order to gauge people's views on significant events affecting the implementation. The quantitative data was derived from qualitative data in terms of frequency of occurrences of events within a category. Initially these events were a focus of the study, only to move towards the perception of the events, activities and states after the scoping phase of research, when communication was identified as a major and under-studied problem of the implementation process. In that respect, initially the research perspective had some elements of positivism as what was studied was a process 'external' to the participants. With the focus on communication, the perspective shifts significantly towards the interpretation of the events that the participants give. However, the processes were still explored in parallel, with the emphasis on the interplay between the process and its interpretation. This shift was a natural selection of the perspective in the light of the results from the scoping phase. The perspective is seen to be of particular benefit to gauge the perceptions of people involved in the implementation process and what effect communication has on them.

The research design can be classed as flexible, according to Robson (Section 3.3). The design itself developed, changed and evolved in the light of the data and supported by literature, comments by the participants and peers, the author's recognition of what worked well during the data collection and what did not support the research process, and the relationship with the interviewees. Discussion on data collection method follows below.

Bearing in mind the research questions, the use of primary data from direct interaction with individuals in this type of research is normally taken as expected. However, documented evidence from the companies was beneficial in terms of an 'objective reality' check and confirmation of the interview data, with articles addressing the project plan and interviews with project management being of particular interest. Other documentary evidence was used, such as project proposals and presentation slides, company web-sites and project posters. In terms of secondary data, during the initial

literature review, many case study papers and articles were found which had a wealth of information about the implementation process. It was decided to exploit them by applying the same type of data collection method. However, the conclusions about the connection between the causes and events can only be drawn based on logic and sequence of the authors' stories, rather than on the absolutely clear link that was explicitly made by the author. Additionally, the presentation of the events had already gone through the filtering lens of the original author. So the secondary data can be seen as the interpretation of interpretations. This was particularly noticeable in case of the practitioner type literature where the reporting of the case was obviously biased in order to tell a specific success or failure story of enterprise system implementation.

The method of inquiry for the collection of primary data was the case study. Considering that every implementation is dependent on the context to a great extent, and communication during the project in particular, a case study was chosen as a way to study in depth initially the processes occurring during the implementation, and then communication more specifically. In the cases when the connection with the company existed prior to entry to collect data, the relationship was significantly more trusting. The points of contact had sufficient authority and power to facilitate data collection and no 'sticky' situations occurred. However, in one case there was no prior relationship with the company. Additionally, the company did not have any experience with this type of research. On one hand, this resulted in less trust in the research and the researcher, constant checking of what could be reported publicly and what should be omitted, tight timing of the interviews and plenty of project information withheld by the point of contact. On the other hand, the interview arrangements were handled professionally and there was keen interest in the results. It can be noted however, that the point of contact was directly involved in the project and it could have been seen that the findings of the research might have threatened the position and reputation of this individual. For these reasons, all the findings were presented back to the company in the form of learning opportunities rather than judgment of how well the individuals in the company were performing.

Interviews and focus groups or workshops were the techniques used for data collection. The interviewees were in general responsive to the questions, and elaborated on the answers when probed. It could be noted that during every interview there was a process of building familiarity and trust between the interviewee and the author. Some interviewees appeared very relaxed, while others who had less involvement in the project had less to respond with, and when probed, commented that they were not aware or not particularly familiar with the specific issue. The top management were generally focused on answering the questions very succinctly, which made interviews more formal and tense. The exception was the company director and the Project Manager from the SME, who was elaborate and sufficiently detailed in her answers. It could also be noted that some of the respondents were abstract in their responses, which resulted in the author having to probe in more detail for the specific examples which were then given.

An additional issue that arose repeatedly during the interviews was that the language of every interviewee was different and needed to be adjusted to. For example, the consultants used different terminology from the interviewees from the marketing department. If an interview is seen as a communication event, then the process of reframing that the researcher has to go through in order to understand the interviewee's

view of the world is particularly important to enable research of this type to be conducted. So, in effect, the success of the communication research process depends on how skilful the researcher is in communicating both his or her own ideas by asking the appropriate questions, and grasping and understanding the interviewee's world through snippets that he or she has communicated. A question can be deemed appropriate if it is both aimed towards answering the research question, and pitched and phrased in the way that the interviewee would understand correctly.

Some of the issues discussed during interviews could have been seen by the interviewees as 'touchy', i.e. something that an external party should not inquire about and that they should not reveal, as the company, their peers or themselves could be judged. With this in mind it was particularly important for the researcher to be curious and supportive at the same time by asking appropriate questions and by using the right tone of voice.

Focus groups and workshops were other techniques used to collect or triangulate the data. Different dynamics were present in these two types of group interaction. In one focus group there was a self-appointed leader who took her position of authority and guided the group towards the completion of the tasks given to the group. This worked well and the group managed to get close to completing the final task. In the other focus group, however, there was no self-appointed leader for a long period of time. This group mainly comprised people not directly involved on the project, be it by their location, hours spent on the project or responsibilities on the project. The group had many more difficulties in making decisions in general. This group provided a lot of insight into the causes for the selected event, however the conclusion was that there were no actions to address the event, and no outcomes related to the event. Finally, a workshop format was used in order to report the initial findings and triangulate the data, rather than obtain new data. The participants appeared open to the opportunities for improvement and learning, rather than attaching blame to a name. A follow-up meeting was scheduled to address the issues that were reported to them and to turn them into tangible actions. In terms of participant language during group discussions, the researcher adjustment was reduced, as the participants of the group had to moderate their language for the rest of the group to facilitate their understanding.

7.2   Data collection and analysis

The purpose of this section is to address the development of the data collection and data analysis method in the light of the findings. In the light of other research, this thesis goes further in practical application of the SWOT chart as a tool for data collection. Additionally, the Cause-Event-Action-Outcome pattern which was used in the past for tracing processes within the implementation project is applied here on the communication processes. The communication frameworks developed in this thesis constitute minor theoretical contribution to knowledge, as the creation of any framework would constitute the building of theory from the data.

7.2.1 Data collection

7.2.1.1 The use of the SWOT analysis

The SWOT chart was used in the final case study to facilitate data collection and recording. The purpose of its use was to provide a general picture of the communication, before the interview would focus on specific communication successes and barriers and go along the timeline backwards and forwards in the form of causes and follow-on actions and outcomes.

Overall, the SWOT chart can be judged to be a good means of data collection in this case. It enabled the production of a rapid snapshot of what the interviewee saw as working well or not as well with regard to communication during the implementation, and it helped in eliciting the interviewees' perceptions of the project and the communication on and around it.

The interviewees generally seemed to find it easy to use, and the chart as an additional tool provided a way of recording the interviewees' responses, as well as giving more structure to the interview. One of the drawbacks was that the interviewees needed to be reminded that the chart related to the communication within the project, rather than to the project itself.

7.2.1.2 Communication successes and barriers seen through the Cause-Event-Action-Outcome pattern

This tool for data collection was developed from the one previously used in the scoping case study. However, the format was initially different in that it involved asking the interviewee what events were deemed significant, both positive and negative, which affected the implementation of the enterprise system (Sections 2.1.3 and 4.1.1.4). Hence initially it was used to focus on the overall processes, by gauging the significant events, causes of these events, actions taken and outcomes.

As the use of the tool proved to be straightforward for the interviewees, the decision was made to use it for communication processes as well. However, the terminology used in the first communications case study in Drillco was not adequate in that the terms 'event' or 'state' were used in asking the interviewees to fill in the chart. This then influenced the participants to focus on events specifically, without giving much thought to states or activities. For this reason, in the study in Healthco the decision was made to use the terms 'communication success' and 'communication barrier'.

The term communication success produced the desired answers. However, there was some confusion with regard to the term communication barrier. When asked for causes for a communication barrier, one or two interviewees inquired whether the question referred to the reason for it to be a barrier, or cause of the barrier itself to be present. They were told to elaborate on the cause of the barrier to be present, which clarified the question. However, it can be stipulated that even the interviewees who did not ask for clarification might have had the same question in mind without asking it explicitly.

Relating to the previous section of the interview, the focus on successes and barriers in communication followed on well from the SWOT chart. The great majority of interviewees did not encounter any problems while filling in the C-E-A-O chart. Only one of them had some problems with structuring her thoughts about successes and

barriers, and encountered some difficulties in filling in the chart. However, she proceeded to explain verbally what should go into it and did not fill it in completely.

Overall, the use of terminology followed an emergent pattern and care was taken that the questions, phrasing, and the terms used were appropriate and to the point. This was done in order to help the interviewees elicit significant information related to answering research questions. Additionally, at this phase of an interview, the purpose of questions was to develop the relationship with an interviewee further and maintain trust and openness, while also ensuring the researcher's understanding.

7.2.1.3 Questions relating to commitment, ownership and concerns regarding change

Initially, in Drillco, the questions at the end of the interviews related to loyalty, ownership and anxiety about change (Section 4.2.5). However, the terminology used in the questions was deemed too sensitive and not sufficiently 'politically correct', and as such might have compromised access to cases and interviewees. Subsequently, the terms were changed for the following case, to 'commitment' as opposed to 'loyalty', and 'concerns' rather than 'anxiety'.

The questions were linked to each of the communication events raised. This was deemed too narrow and the questions were opened up for Healthco interviews to be more general rather than related strictly to the events. Additionally, due to interviewees' comments about the questions, they were rephrased and simplified.

However, although the questions in the Drillco interviews were more cumbersome to understand, they revealed more about the interviewees' attitudes and perceptions. The simplified questions for Healthco appeared to be too far removed from the context and did not give as much clear and concise information as those from the previous case. It is possible that the early questions were easier to relate to precisely due to the sensitive terminology. In addition, the interviewees appeared more open and willing to cooperate, possibly due to the company size and the sense of participation that the employees had. They seemed to put more thought and effort into answering these questions than the interviewees from Healthco.

7.2.2   Data analysis

7.2.2.1 The development of the communication frameworks

Three communication frameworks were developed: for the events, their causes and from the data in the SWOT chart. The first two went through two development stages, as the data was collected in the same format from both Drillco and Healthco. However, the SWOT chart was used only in Healthco and therefore it was developed based on one set of data. The purpose of these frameworks was to 'bind' the data and provide a provisional structure to enable better understanding of the issues. They do not provide a definitive set of categories that are exclusive, nor was that the intention behind their development.

7.2.2.1.1   The development of the framework for communication events

The communication framework was developed based on the events, states or activities during the project, and separately based on the causes of those events. The framework

was built initially for the Drillco case and then extended in the light of new data from Healthco. From the interviewees' responses the communication events which were identified as significant were classified according to four categories initially. These were:

- Strategy

- Management activities, such as planning and announcements

- Technical knowledge exchange

- Technically related communication events.

Following this framework, the interviewees in Healthco identified the communication events as significant, either as communication successes or communication barriers. Based on the previous framework for data from Drillco and the SWOT chart, several categories were used. These were:

- Strategy

- Management activities

- Motivation

- Knowledge:

  o Bigger picture

- Communication across the project

- Communication structure and process

- Facilitators

7.2.2.1.2   The development of the framework for causes of communication events

Causes for significant communication events were classified into categories according to the theme of the cause. Five groups emerged initially. These were:

- Technical reasons for communication

- Strategy

- Management

- Resources

- The image of the company.

A number of categories were used from previous classifications in order to further develop the framework for causes of communication, in the light of the data from Healthco. The frameworks used were the framework for causes of communication events in Drillco, SWOT chart data analysis framework and framework for communication successes and failures, both from Healthco.

The categories that were used here are:

- Strategy

- Management activities

- Resources
- Knowledge:
    - Detailed, individual picture
    - Bigger picture
- Communication across the project
- Communication structure and process
- Facilitators
- Technical

7.2.2.1.3 The development of the SWOT framework

One framework was built from the data based on the SWOT charts. It can be noted that there were some parallels between the groups of data within the Strengths, Weaknesses, Opportunities and Threats field. With respect to this, the categories were developed to include:

- Strategy
- Motivation
- Knowledge:
    - Detailed, individual picture
    - Bigger picture
    - Keeping informed
    - Technical issues
- Communication across the project
- Communication structure and process
- Facilitators

7.2.2.1.4 On communication frameworks in conclusion

Communication events were developed in order to group the data according to the theme and looking at the whole picture of what any particular statement that participants wrote actually meant. However, their purpose was not to be exclusive and conclusive, but to facilitate understanding of the communication issues and processes occurring during enterprise system implementation. It is deemed that as such, they enable a better grasp of the findings.

7.3 Research findings

The discussion of the research findings is presented in the light of their use, from the process perspective, the timing within the implementation process, the communication processes that the key project stakeholders are involved in, the effects of the communication on the commitment, psychological ownership and concerns about

change, and the additional findings relating to the organisational structure, cohesion and trust in the light of the SME and the large company studied. In the light of other research, this thesis goes further in understanding the role and significance of communication as a process during the implementation of an enterprise system.

7.3.1 Process perspective

This research has taken a processual perspective where initially the processes occurring during an implementation of an enterprise system were studied, and then more specifically, communication processes. According to the process theory, the conditions which exist for any particular event to take place are necessary but not sufficient, as the context itself provides numerous influences which might not be covered or identified by research. In the review of the literature on the use of process theory, it transpired that factor approach and variance theory have mainly been used in the study of IT system implementation, and that the application of process theory was mainly limited to the study of different phases in the implementation project.

This research has attempted to study the processes in more depth within a specific phase of the implementation project. The chain of events in the form of C-E-A-O has been used to gauge the process occurrence. However, there was no other guidance that could be taken from the literature on how the processes, and especially their effect on the employees, could be studied, within an organisation involved in enterprise system implementation, nor any other IT system implementation.

It became transparent during the course of this research that the development of the method to gauge processes has not been particularly problematic. The participants appeared to find it easy to use and were cooperative. However, the information about processes was a challenge to analyse, as the analysis could only be one-dimensional, based on the events or causes, while it was still necessary to maintain and preserve the process as a whole and see it within the context.

7.3.2 Timing of the study of processes

With regard to the timing of the study, it was expected that at the phase just before the go-live date, the end users would be sufficiently familiar with the changes that would take place beyond the point at which the system was turned on and the old system was turned off. During this phase, the new system is tested, and the users have already provided some process specifications for system development or have cleansed the data to prepare it for the system. Just before the go-live date is also the time when they are trained to use the system.

In case of Durco, the key users and end users were either on the project full time on a contract or part time. However, they were not located in the same office as the rest of the project team. At the stage when the data was collected, the uncertainty about what was going to happen after the go-live was present.

In case of Drillco, as the study was conducted just after the go-live date, the users were already familiar with the system, had received the training and had started using the system. Additionally, the system was only the Windows based version of the old mainframe enterprise system that the company already had. In that sense, the change was not revolutionary but evolutionary.

In case of Healthco, the users had completed the requirements for the new system in terms of processes and had worked on data cleansing. The key users had returned to the core functional departments they were formally in. The training had not taken place yet. The communications team was heavily involved in 'spreading the word' and the 'pavilions' were placed for the users to roam around when they had time. However, although the users were aware of the bigger picture, and the importance and relevance of the system to the company, what was missing was the awareness of how the new system would affect day-to-day jobs.

7.3.3 Aspects of communication significantly affecting the implementation process

The importance of the findings within the framework is that they give an insight and understanding of what project participants or employees affected by the system find significant in communication during enterprise system implementation, what proved a success if present, or a barrier if not present.

The framework involved the findings under specific themes of:

- Strategy

- Management activities

- Motivation

- Resources

- Knowledge

    o Detailed, individual picture

    o Bigger picture

    o Keeping informed

    o Technical issues

- Communication across the project

- Communication structure and process

- Facilitators

- Technical issues

Issues relating to the communication about strategy include forward thinking regarding the project scope and how this relates to the needs of the company initially in the conception phase. Following on from there, important communication becomes more focussed on practical aspects of project strategy: financing, benefits delivery, and imbedding the project once initiated and the system into the business by means of goal focussed communication, communicating the significance of the project, and making this communication understandable by the business, i.e. the employees, as well as finding the points of influence and authority to make more impact. This communication is both two-way and formal on the management level, or one-way from the management to the business and formal.

Communication at the management level of the project relates to operationalising and actioning the project. This includes project proposition meetings and announcements to

the employees regarding the project, as well as the extent of communication measured in time and cost, and management insight into responsibilities and progress on the project. This communication is either two-way, in the case of management communication, or when within an SME. In a large company it is one-way. It can also involve decisions about how much time and money is going to be spent on communicating and project control issues.

Motivation involves internal drivers for communications, such as desire, time and involvement needed for communicating. In that respect it also depends on other priorities that the employees have competing for time and priority with communication about the project to enable them to get involved.

Resources involve location problems that might facilitate or obstruct the communication process. Additionally, the day-to-day job and having the business to run is seen by the employees as being in competition with communication about the project and the project itself. This category deals with practical obstructions or enablers to communication on the project.

Information that the users need in order to build a detailed, individual picture of the changes on an individual level, what their jobs would look like in the future, and what the next steps are to take in order to get ready for the system is very important. If this is present, it reduces the level of uncertainty in the users. However, this often seems to be the problem. The literature also recognises that this is the time when users need most information, but management has the least, and does not wish to give unclear and imprecise information, so they choose not to communicate much about the specific changes. There is a clash between users' information needs and what the management is capable of providing, or wishes to inform the users about. This communication includes both two-way and one-way communication directed to the users.

On the other hand, communication about the bigger picture is equally important. This includes gaining knowledge about parts of the system not directly relevant to the users, exposure to information about the relevance of the system to the company, and this being communicated through vertical communication channels, details of the system design, using the learning from the past about the importance of communication during large projects, and awareness if the users' information needs were addressed. It is natural that knowledge about the bigger picture would be developed first, before the individual detailed picture. It also affects the level of uncertainty in the users, but on an organisational level. However, according to the literature, the users would not retain information that is not relevant to them. This research shows that they do retain the overall picture. There is the additional risk of users becoming bored with excessive information of this sort, and angry, especially if there is insufficient information about individual changes.

In terms of keeping the users informed, they need to be kept up to date and able to keep track of the changes and what is happening on the project. Other barriers to communication, such as a different location and formality of communication, affect their ability to keep up to date. The barriers make it more difficult for them to feel that they are keeping abreast, as opposed to being not only out of control with what was going to happen, but also not knowing what, how or when it is going to happen.

Technical issues also need to be known by the users. The users, as well as people who are not working on the technical solution are generally not aware of the normal

software development cycle and might be concerned with the system still being developed very late into the project. Again, this affects the impression of the project being out of control and could affect the level of anxiety. Contingency plans to the extent that the users and the management know what to do if the system does not work as planned on the go-live date would increase the feeling of being in control, or of the project being in control of the project management team.

Communication across the project is another theme that is found to be important. It includes hosting events that would enable the communication flow to take place between the project management or management and the rest of the project team, usually related to gaining a bigger picture of the project; streamlining the language used so that people communicating can understand each other; interdepartmental communication on the project and between different project streams, e.g. marketing and sales representatives on the project; building in mechanisms to enable recognition if communication efforts are achieving their purpose; enabling communication between the project team and the business to take place by utilising people from the business; and making communications targeted, concise and formal. Some of these efforts would result in one-way communication, with the purpose of raising awareness, and two-way communication, with purpose of increasing understanding and cohesion of the project team in particular, or the project team and the business.

Communication structure and process are related to communication across the project team, as without such a structure, communication would not be taking place across the project. This theme involves different project meetings and away-days, where the project meetings involve one-way communication, while the away-days enable two-way communication as a quick response to employees' questions. Additionally, project posters and intranet sites increase the visibility of the project, but are insufficient as means of exclusively one-way communication; the existing communication channels that the project team can 'plug into' ease communication; and the location of the team makes communication less formal. Other priorities that the users might have are addressed by putting in place procedures that would recognise key user participation on the project, but there is still the risk of project communication being 'drowned' in other information with higher priority for the users, which unlike project communication, might relate to their yearly bonuses.

Facilitators of communication processes during enterprise system implementation include most of the people in the project team, and the ones who facilitate the embedding of the system in the business. They include the out-going Project Manager, the Communications Manager, and key users. On the project boundary, but still project stakeholders, senior management, Heads of departments and Business Implementation Managers all facilitate communication. The former two do it from the position of established organisational hierarchy and the authority that it gives them, while the latter act as a link between the project and the business. Using other key users to support learning of the new key users is an option available when there is a sister company involved in the same type of project prior to implementation. Additional facilitation of communication occurs when the whole department is involved in various stages of preparation for go-live, which links to the issues of team cohesion and commitment, discussed below. Additional requirements for facilitating communication are the employees who would be capable of transforming the project material to target specific departments. Resources who know the business well and were the right people in the

right place would facilitate the building of the system, rather than communication directly. Finally, people who are in responsible positions act as a 'soggy sponge' and absorb information regarding project delays, in particular, due to being held accountable if the project is delayed.

Lastly, the technical issues raised as being important in communication include testing and the implementation of a dummy system as a base on which organisational team cohesion is facilitated, training, requests for system requirements, system redesign and constraints imposed by the old system. The technical issues were predominant causes and events of communication in the SME, whereas they were not particularly present in the large company. Apart from training, all communication based around the technical issues was two-way communication.

7.3.4   Transfer of ownership, commitment and employee concerns

The change in an SME company is classed as evolutionary and additive, where it is the upgrade of the system that is being implemented, so that the additional features of the system are the ones that the employees themselves requested. In that sense, the change can also be classed as partly self-initiated, as the management passes on the decisions about the choices for the system support to the users. So in effect, this results in promotion of change. However, the transfer of ownership of the system is seen to be achieved through the acts of providing the requirements of the system, which then, once they are incorporated in the new system, signify the mark that the users have left on the system. This also signifies recognition that users' needs are integral to the business, and would thus result in users feeling they have a greater ownership of the system. In the case of the SME, this form of user participation in system development is possible due to the low number of employees affected by the change. Additional mechanisms of testing, using the dummy system and training enable an increase in users' familiarity of the system and increased ownership of it.

In the large company the responsibility or ownership was distinguished between the ownership of the execution of the project phases, ownership of the system, and ownership of the system development. The change in a large company is revolutionary, as all the previous legacy systems need to be integrated into the new system, and could be viewed as subtractive, as it diminishes the essence of what an employee is attached to, which is the previous legacy system to provide data. The change is not self-initiated but imposed from the management. Thus all the points that would affect the organisational ownership, and thus result in resistance to change, are present. In order to encourage the transfer of ownership of the system from the top management to the department, the savings were incorporated into departmental budgets when the changes were scoped and the savings calculated. The departments were given the responsibility for signing off the system, which meant the person signing off the design needed to be satisfied with it. It is in this act of signing off the system the user would work with that the transfer of ownership of the system in a large company lies. The transfer of ownership for the system development was not known among the users. However, the problem with large companies, as opposed to SMEs, is that not all users can take on the responsibility for signing off the system design due to the sheer size of the departments.

Commitment has again various aspects from the perspective of SME employees and large company employees. Within an SME, the commitment is gained on an individual level through formal or informal contractual situations, with the parties being involved

in the dialogue in order to reach an agreement. So, the action of involving users to contribute by providing requirements of the new system is seen as increasing commitment. Thus, the 'strong positive attitude' towards the system was developed and the users had a 'behavioural intention' to work hard towards a better system. On the other hand, training, being a one-way transfer of information regarding the new system use, did not affect the level of commitment.

In a large company, involvement on the project day-to-day affected participants' level of commitment. The management was fully committed to the project. The key users perceived their commitment to the company increasing through their involvement in the project. They were keen to pass on the newly gained knowledge from this involvement and to see the system work. End users did not express much commitment to the system as they were detached from it and were not involved in the project apart from in simple tasks such as data cleansing, and were only exposed to communication about the system. As they did not need to work extensively for the project, the relationship with, and 'strong positive attitude' towards the system was lacking, and hence there was no commitment to it.

However, in both cases the users in an SME and the key users in a large organisation participate in designing the change and in that way gain the feeling of being in control. The end users, on the other hand, have very limited involvement, and hence no feeling of control over what is happening. Additionally, the principal support component of the change message is expressed through reassurance of support from the management and the System Developer in the SME, and through inclusion of participation on the project in key users' yearly performance agreement in the large company. With regard to the organisational commitment being increased by vertical hierarchical rather than horizontal cooperation communication, the parallel cannot be drawn between project hierarchical communication and project commitment. If the formal communication about the project follows project communication channels from project management to key users and from key users to end users it cannot be concluded that the project commitment of the end users would be greater. Further authority issues are elaborated on below (Section 7.3.5).

With regard to the change and anxiety about change, the evolutionary change with no BPR in the SME was seen as favourable and contributing to the employees' day-to-day work. There was no perception of loss involved and the uncertainty about future work and the extent of the change was only related to the use of the different platform-based system and the level of support provided by the management and the System Developer. Challenge was one of the five factors affecting the adeptness to change identified in the literature, and it involved the perception of change as a threat or as an opportunity. The change in the SME was seen as an opportunity to improve and the anxiety brought about by it as being pleasant.

However, in the large organisation, the revolutionary change was seen to be only small on the individual level officially, but the users were not aware of the specific changes that would happen in their jobs. The only ones aware of the changes were the users with high project involvement, i.e. the key users. However, high levels of uncertainty on an individual level did not produce anxiety. This can be explained by the employees having confidence in the training to address all their system use needs. The support beyond the go-live date was accounted for and the users were aware of it, which might

have additionally reduced anxiety about the use of the system. Anxiety about job losses was not present either. If the findings from the scoping case study are taken into account, the level of anxiety depends on how obvious the cuts in the number of employees are. If the employees see that the cuts are likely and the duplication of work, as a possible consequence of an enterprise system implementation, is obvious that they will have more concerns. If the duplication of work is not obvious, and the users are not informed about the cuts, they are not anxious. Even if they are aware of the possible cuts and comparable information is available from other similar companies, they do not feel that their position is in danger.

7.3.5   Other themes: organisational structure, cohesion and trust

There is a noted difference in company size between an SME and a large company, and this affects the number of layers in the company hierarchy and the interaction between the permanent organisational hierarchy with the temporary project hierarchy. The key difference between an enterprise system implementation project in an SME and a large company is that the project team in a large company is pulled out of the departmental context and together into the project context. As the team is temporary, they need to quickly establish the team structure and communication channels according to the lines of authority on the project. However, this communication network runs like a mesh through an organisation, where a priori structured communication channels exist. The project team needs to 'plug into' the established communication network and maximise its exploitation. A barrier presents itself in the lack of authority that the project management has over the users-to-be. As the distribution of authority is hierarchical while the users are in their departments and not directly involved in the project, the project management has to find a channel merely to be able to reach the users.

Another option the project team has is to build a communication network between the project team and the business by exploiting the key users involved in the project. These key users can then serve as communication carriers between the project and the department during their project involvement and upon their return. However, what seems to happen is that once the key users have returned, this link between them and the project breaks down and they do not function as communication carriers. The key user has returned to the department after being away for a considerable time, doing something very different from everyone else in the department, so the key user becomes an outsider. They try to integrate back into the old department by keeping quiet about the project and their experiences. In turn, the users-to-be return favours and keep quiet about the outsider's experiences by ignoring them and their experiences. The employees within the department now have less in common and the cohesion is reduced. Additional communication carriers, apart from the key users, are independent carriers of information – Business Implementation Managers, who know the business and are from the business, but with no allegiance to any one department. Their use appears to have a great effect in getting people on board.

In an SME, on the other hand, the project channels are the formal communication channels which existed a priori. This makes communication flow easier, with more impact and more control, as all relevant communication comes from the people with authority. Additionally, considering that communication divisions between formal and informal are blurred, this facilitates the flow of information and the dialogue between the management and the users.

On an organisational level, in a large company the cohesion between the departments is less present, due to the sheer size, as well as to historical factors. However, the new system breaks down the departmental barriers, transactions become more visible, and who is doing what, or not doing equally so. Errors become traceable as well as performance. So a large company supported by an enterprise system needs to go through breaking down these departmental barriers and any silo mentality that may have existed. In an SME, departmental cohesion is complete as each department is an individual or a small team. They are all close together and work together as a team to understand the system as they are fully aware of the benefits to the company. Additionally, each individual sees how the system specifically supports their job and makes it better or easier, as they designed the changes themselves.

The issues of trust are additionally significant in the implementation of the system, albeit in a subtle way. The lack of trust creates more uncertainty. So if the management does not trust the consultants, there will be more uncertainty related to the technical side of implementation. If the users don't trust that the management is giving them the full picture about job losses, there will be more uncertainty about their future. In an SME, the management trust that the users will make the right choice given the right information. The users in turn trust the management that they are making the best decisions for the company. In a large company, on the other hand, the users trust that the training would be adequate and sufficient for them to operate the system. They also trust that the management is providing sufficient information to them. However, the cuts in the number of employees are obvious as the jobs will change and the work will be more efficient. Additionally, other parts of the company which underwent the same change cut their workforce by a high percentage. The question then is why the employees chose to ignore the links between high efficiency, comparative cases and the number of people who left. There are two possible explanations for this. Either they trust the management that they would be still employed if the management is not communicating any changes to that effect, or they choose to ignore the facts and hope for the best. This facet of trust is implied and observed through a lack of anxiety or outright 'blanking out' of the possibility of the job losses.

7.4   Conclusion

This chapter discussed the research method, data collection and analysis method, and the findings, in the light of the research questions 3, 4 and 5. As such, and with reference to Section 3.10, it elicits the contribution to knowledge in the areas of research method and findings. In terms of the research method, both data capture and data analysis are novel, and building on previous research of the implementation process, in the area of communication during an implementation in that they present and preserve the process view of the communication. The findings are novel in that there has been no recorded attempts found in literature to study the role of communication during these projects in depth. Additionally, and more implicitly, the chapter reveals the simple frameworks developed to bind the data and facilitate the understanding of the findings. This can be regarded as contribution to knowledge in the area of theory development.

In contrast to Sarker and Lee (2003) as the main researchers in the area of communication in enterprise system implementation, this thesis concludes that communication is necessary for an implementation to happen. Additionally, leadership

which the authors claim to be a necessary factor can only be operationalised through the communication process.

What can be concluded from this discussion? Where and how can this research be applied? What can be recommended for future research? These questions are answered in the Chapter 8.

8 CONCLUSION

The purpose of this chapter is to summarise the key points from the research, including contributions to knowledge, the limitations of the research, and recommendations for future work.

8.1 Contributions to knowledge

Communication is an area which seems to have been particularly neglected in research on enterprise systems. One reason for this neglect might be the fact that the factor research stream stresses communication as one of the important factors, and that is deemed sufficient. However, it does not go into depth as to the type of communication, in what form, or by what means, which is needed by the users. There is a gap between what users need as opposed to what management thinks that the users need.

Additionally, organisational communication during implementation is *assumed* to be happening. Indeed, communication is such an intrinsic process to human beings that it is very often not thought about. Everyone on the project talks to everyone else, people are approachable, but the closed door when an HR person goes into the supervisor's office sends yet another message. Consequently, it is a challenge to bring communication out into the open, study it, investigate what works and what does not work so well, and for what purpose. It is seen to be a 'touchy' issue, especially if companies invest a lot of money, time and resources towards making it work, only to discover that it does not work as well as envisaged.

Criteria for contribution to knowledge are addressed in Section 3.10, and discussed in Section 7.4. The contributions of this research are in the findings and in the method used to arrive at the findings. Implicitly, additional contribution is in theory creation based on the findings and the development of the framework of themes relevant to the role of communication in enterprise system implementation. Conclusions from the research are presented thematically, following from the discussion, with conclusions pertaining to the findings first, and then moving to the methodological findings, in line with significance and prominence.

Communication

1. Significant communication relating to the strategy of the project and IT system strategy is the first step towards system implementation when the initial discussions take place with IT system and project stakeholders, and then move on to project realisation. Communication strategy needs to be decided and influential points of contact found within the project team and organisational structure with sufficient seniority and influence.

2. Management activities include communication activities relating to operationalising and actioning the project within the business. On the management level and within an SME they are two-way, while in the large company, management-user interaction is one-way.

3. Motivation to communicate and openness to communication is crucial coming specifically from the project team members including key users, and end users.

4. Resources, such as location of the project team and time constraints on the end users, can prevent or allow communication to happen.

5. Knowledge

   a. The detailed, individual picture forms a part of what users need to know in order to reduce their levels of uncertainty about future steps in the project and future job changes.

   b. The bigger picture needs to be developed by the top and project management initially, in terms of how the system supports the company goals and how the changes would affect the company on the organisational level. This awareness helps reduce levels of uncertainty about future on the organisational level.

   c. The project team needs to keep the users informed of the developments on the project to reduce uncertainty about present changes and support the feeling of being in control.

   d. Technical issues need to be addressed in terms of developing a contingency plan and communicating it, which relates to what would be done should the technical side of the implementation fail at the point of go-live.

6. Communication across the project is necessary both in order to achieve team cohesion and cohesion of the team and the business, and to enable the system development and take-up of the system by the business. This process starts with the use of common language on the project and among project members and users.

7. Communication structures and processes need to be present to enable communication among the project team members and the business to take place. These are project or business meetings which enable two-way communication, maximising the use of formal communication channels already in place, as well as formal structures put in place to recognise user involvement on the project.

8. Facilitators are necessary as communication carriers to make communication happen. Apart from their personal characteristics and being motivated to communicate, they need to be dispersed in the project team, at senior positions within the organisational hierarchy within the business, and acting as a link between the project and the business, but coming from the business. Care should be taken about the 'soggy sponge' phenomenon, where there is a risk of troubling information being ignored due to accountability of the people within the sponge.

9. Technical issues as reasons for communication are important in the light of developing a better understanding of the system and increasing organisational cohesion by performing activities together.

Ownership, commitment and anxiety

10. Transfer of psychological ownership of the system in an SME is achieved thorough user participation in system development, which is possible due to the low number of employees. Additionally, the acts of testing, using the dummy system and training enable an increase in users' familiarity with the system and increased ownership of the system.

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11. Transfer of psychological ownership within a large company is achieved by the acts of key user sign-off of the parts of the system. The more users that can be involved in this process, the more points within the business own the system. However, due to company and departmental size, it is not possible to get everyone involved in this process.

12. Transfer of ownership is partly achieved through communication, as it is by communicative means that the users become involved in system development activity and signing off the parts of the system. However, it is the activity itself that enables transfer of ownership.

13. Commitment in an SME is gained by the involvement of parties in formal or informal contractual agreement. In large organisations, commitment results from continual project involvement.

14. Parallels can be drawn between users in an SME and key users in a large organisation in terms of the 'strong positive attitude' towards the system and 'behavioural intention' which signify commitment. End users in a large organisation do not have an opportunity to develop commitment.

15. Commitment is achieved through communicative action of contractual agreement in an SME, while in a large company it is the result of project involvement. End users in the large company are not involved, nor are they in a contractual agreement, but are only exposed to communication which does not result in the development of 'strong positive attitude' and 'behavioural intention', and thus does not increase commitment.

16. The type of change – evolutionary, and low level of uncertainty about the future in an SME resulted in low levels of anxiety in users. The improvement in the system is seen as beneficial to the company and users.

17. The type of change – revolutionary, and the high level of uncertainty about the future in a large company did not result in anxiety. If the duplication of work is not obvious, and the users are not informed about the cuts, they are not anxious. Even if they are aware of the voluntary redundancies and comparable information is available from other similar companies, they do not feel that their position is in danger.

18. The lack of anxiety about system use in the large company can be explained by the employees having confidence in the training to address all their system use needs, and the support beyond the go-live date, of which the users were aware. In an SME, the anxiety about system use was reduced by testing of the dummy system and training, and reassurance about support from IT personnel.

19. Levels of anxiety are directly related to communication in that the level of uncertainty can be reduced by using appropriate communication, preferably two-way and face-to-face, coming from the management.

Organisational structure, cohesion and trust

20. When organisational and project structures are not aligned, the project team has a few ways of reaching users: making the most of the existing organisational structure by getting the heads of departments on board, using key users once they return to the department, which does not achieve the intended communication purpose, or

using non-aligned respected company employees who act as a link between the project and the business.

21. A large company supported by an enterprise system needs to break down the departmental barriers and the silo mentality that exist to enable enterprise integration to happen. In an SME this is not an issue due to the organisational cohesion already in place.

22. Trust plays an important role in reducing uncertainty, and thus anxiety, in all parties involved in enterprise system implementation, especially in terms of what and how much is communicated to the users.

8.2   Application and limitations

The major application of the research findings is within the domain of enterprise system implementation. However, it is envisaged that any kind of IT system implementation or any other project involving BPR or change would benefit from a better understanding of the communication issues during change process and taking up of the system and change in general by the business.

Additionally, it is possible to use the approach and the techniques used here to study the processes during an enterprise system implementation, IT system implementation or change project.

The researcher studying communication processes needs to be aware of communication filters between the interviewees and the researcher, and must be intrinsically interested in improving their own communication skills. Interviews, focus groups and workshops provide ample opportunities for that, and, indeed, necessitate constant self-reflection and communication skills improvement.

This research is limited in that the data was collected from one large organisation for the scoping study, and one SME and one large organisation for the study of communication issues. As such, the issues discovered are imbedded and inseparable from the context in which they are set. It is not possible and not envisaged that generalisations could or should be made. However, the reader coming from practice should still be able to draw parallels between their experience and research presented here.

8.3   Recommendations for future work

This research has illuminated several paths of interest that could be followed by other researchers. Firstly, it would be interesting to conduct a longitudinal study of how communication processes in the phases before the go-live of an enterprise system affect the take-up of the system itself in the same company by the end users. This would reveal more issues around the effect of communication on ownership and the change in development of psychological ownership, and commitment to the system further in the implementation process.

Secondly, an intervention to enable better integration of key users' project and system knowledge in the department would be beneficial to study. Considering that communication between the key users and end users about the project is broken, more insight would be beneficial into the restoration of this link by the means of facilitation

of the communication process between the key users and end users once they arrive back to the department in line with restoring departmental cohesion. This could be addressed by using the methods of action research.

Thirdly, the issue of transparency of work that occurs during the running of an enterprise system is not researched. This would involve research of company culture as well as users' perception of transparency of processes and necessary change of behaviour and silo mentality. A further issue of what the management is able to do in relation to this knowledge is of additional concern to the users and has not been made explicit.

Finally, advancement of study of processes in terms of developing the methods used would be welcome, especially in the light of predominance of the factor research stream, which has numerous limitations in temporal study of change.

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APPENDIX A: CASE STUDY PROTOCOL[18]

WORKBOOK

This workbook contains an introduction letter for the company, the case study procedure, the demographic questionnaire, the guidelines for interviews and focus groups and the issue form.

Introduction letters for the company

Different introduction letters are needed.

1. Introduction letter for company that participates in in-depth case study
2. Introduction letter for company that participates in SME case study

Case study procedure

This procedure contains all the information the BEST partner needs to do case studies.

CONTEXT SETTING

Each case study (implementation project) has a Project number, which is a three- letter and three-number combination. The initial three letters represent the partner and the number indicates the case study for that partner. For example UOT004 identifies the 4th case study for the University of Twente.

The contact person (BEST partner) responsible for collecting the data also needs to be identified (first name and surname).

The questionnaire should be filled out by the company. The BEST partner will support the company in filling out the questionnaire. The answers from the questionnaire are recorded in the Context database. The questionnaire is discussed later.

INTERVIEW

There should be an explanation of what the aim of the BEST project is. After that, the information obtained from the questionnaire is used to set up the context. The memory of the interviewee is refreshed by briefly walking through the general part of the filled-out questionnaire.

The context of the person being interviewed should be set also. The following information is needed from the interviewee:

- Department of the interviewee
    - Management / IT-department / Marketing & Sales / R&D / Engineering / Purchase & Logistics / Production / Production planning / Service & Maintenance / Finance / Human Resource / Other
- Role of the interviewee in the implementation

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[18] From Wognum, N., Mensink, G., Fainstein, R., Ma, X. and Löh, H. (2003), 'Case study protocol', Doc. Ref. No.: BEST_WP2_W_20030113_V03, pp. 1-33.

- o project manager / key user / end-user / senior management / IT specialist / project member / project sponsor / consultant / other

- Degree of involvement in the project

  - o % of own work time

- System user

  - o yes / no

- Use intensity

  - o All the time / frequently / rarely / never

This information should be recorded in the interview form in the Issue database. The interview can be done with help of the interview guidelines. The results of the interviews should be recorded in the issue form.

FOCUS GROUP

The information required is as for interviews, done for each participant. The detailed information on the members of the focus group should be recorded in the focus group form in the Issue database. The Focus group can be done with help of the focus groups guidelines. The results of the focus group should be recorded in the issue form.

Demographic questionnaire

A web-based questionnaire is being developed. The Word version of the questionnaire can be found on the BSCW-server in folder WP2, folder Case package.

Way to fill out the questionnaire

The BEST partner will support the company in filling out the questionnaire.

Content of the questionnaire

The questions are divided into three parts to be filled out by different people in the company.

1. Company Characteristics: to be filled out by general manager or other company representative

2. Enterprise System Implementation project characteristics: filled out by project manager or someone involved in (managing) the project

3. Impact on business processes: filled out by project manager or functional manager involved in the project

Collecting project information

The BEST partner collects information on the project in addition to the demographic questionnaire. This information may consist of project documentation and stories on the progress and performance of the project. The stories can be acquired by interviewing in-depth the project manager or other manager involved in the project on the project context. A summary has to be made of the project information gathered in the context interview and from project material. A separate page is available in the issue database to record the project summary.

Guidelines for interviews / focus groups

This paragraph describes the guidelines for the interviews and focus groups.

Guideline for interviews

Background

The interviewer must have context information on the ESI project gained from questionnaire and project information. The interviewer must gather information on the interviewee and his/her role.

Material

Paper & pencils (the interview can be recorded by tape in order to capture all the information)

Interview

1. Introduction and warm-up: (20 min)

We are conducting this Interview in order to understand the implementation process of the _____ system that was implemented in your company.

Optional: Could you describe the process of implementation in order to provide a background perspective. The process can be written on a blank paper (*This should help to define the process)*. This information will be included in the project description page in the issue database.

2. Facilitating events: (7 min)

Could you please list events that are considered critical by you or have strongly influenced the course of the implementation process? What happened during the project that had a major impact on the course of the project?

List at least 4 – in order of importance.

Please list at least one event that had a positive (contributing) effect and other issues that had a negative (blocking) effect on the process.

3. Important events: (5 min)

The 4 most important events (agreed by the interviewee) will be the basis of the discussion. If possible in each interview there must be positive events as well as negative events

Discussion for each event on the following points (15 min for each issue):

a. Details on the event.

    a. What person role has identified the event?

    b. In what phase did the event occur?

    c. Characterise the event: sporadic/chronic; desired/undesired; expected/unexpected; internal/external

b. What are causes for the event – in order of importance

    a. In what phase has each cause occurred?

     b.   What was the impact of the cause?

c.   What actions have been undertaken to deal with the event

     a.   In what phase has each action occurred?

     b.   What person role played an active part in defining or performing the action?

     c.   How much did each action 'cost' (resources, time, budget, etc.)?

d.   What were the effects / outcomes of each of the actions

     a.   In what phase could the effect be observed?

     b.   How much impact did each effect have in terms of 'costs'?

A causes-event-actions-outcomes chain is called an issue. Each chain has to be described in the issue database in the respective fields. These descriptions should be summaries, not literal transcripts.

Guideline for focus groups

Background

The focus group moderator (BEST partner) must have context information gained from the demographic questionnaire and project information. The focus group moderator must have information on the participants in the Focus Group and their role.

Materials

Board, post-its, white paper & coloured pencils (the focus group can be recorded on tape in order to capture all the information)

Focus group

  1. Introduction and warm-up: (20 min)

We are conducting this Focus Group in order to understand the implementation process of the _____ system that was implemented in your company.

Optional:

Could someone from the participants describe the process of implementation in order to provide a background perspective?

The process can be written on the board (*This should help to define the process and review differences in the group's perception of the implementation process)*

The project information is included in the project page in the issue database.

  2. Individual responses: (7 min)

Could each one of you please write down the events that are considered critical by you or have strongly influenced the course of the implementation process? (use post-its) What happened during the project that had a major impact on the course of the project?

List at least 4 – in order of importance.

Please list at least one event that had a positive (contributing) effect and other events that had a negative (blocking) effect on the process.

3. <u>The events from all the participants will be collected on a board 'brown paper' (10 min)</u>

The 4 most important events (agreed by all the participants) will be the basis of the discussion. In each session there must be some positive events as well as some negative ones

4. <u>Discussion for each event on the following points (15 min for each issue):</u>

a. Details on the event.

    a. What person role has identified the event?

    b. In what phase did the event occur?

    c. Characterise the event: sporadic/chronic; desired/undesired; expected/unexpected; internal/external

b. What are causes for the event – in order of importance

    a. In what phase has each cause occurred?

    b. What was the impact of the cause?

c. What actions have been undertaken to deal with the event

    a. In what phase has each action occurred?

    b. What person role played an active part in defining or performing the action?

    c. How much did each action 'cost' (resources, time, budget, etc.)?

d. What were the effects / outcomes of each of the actions

    a. In what phase could the effect be observed?

    b. How much impact did each effect have in terms of 'costs'?

When an event is being studied, the issue form provides the aspects that need to be recorded. The output of the focus groups contains the description of issues (causes-event-actions-outcomes process chains) discussed and agreed upon in the focus group. All issue elements will be stored in the issue database, not as a literal transcript, but as a summary.

For the collection of issues a form based on the database structure is available.

1. Introduction

The demographic questionnaire will be used for collecting context data from cases. The final questionnaire will be developed as a web-based questionnaire. This will happen on the survey site of KPA.

Ways to fill out the questionnaire
The BEST partner will support the company in filling out the questionnaire. The BEST partner visits the company and talks to the people who can fill in the questionnaire and record the data in the web-based questionnaire

Content of the questionnaire
The questions are divided into three parts:

1. Company Characteristics

2. Enterprise System (Implementation project) characteristics

3. Impact on business process

These three parts are further detailed in the next chapters.

2. Company Characteristics

This section contains the questions to characterise the company. These questions should be answered by a general manager or other company representative on the management level.

Questions
This section contains the following questions:

1. Who is your BEST partner contact?

    Choices: Adepa, CEC, Cetim, Cranfield, DTU, Fundecyt, Gedas, KPA, Qualitech, Sintef, UT, Xpert

2. What is your role/title in the company?

    Choices: General manager, Head of Department, other

3. In what way is the company involved in the BEST project?

    Choices: Industrial Support Group,

4. May the name of the company be mentioned in the results?

    Choices: yes / no

5. What is the name of the company?

    Open textbox

6. Where is the company located?

    Choices: Europe, other – specify; one site, multiple sites - specify

7. What is the market stability of the company

    Choices: stable, frequent changes

8. What is the primary line of business of the company?

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[19] From Wognum, N., Mensink, G., Fainstein, R., Ma, X. and Löh, H. (2003), 'Case study protocol', Doc. Ref. No.: BEST_WP2_W_20030113_V03, pp. 1-33.

Choices: service deliverable, product deliverable, both

9. In which market segment is the company working?

> Choices: Agriculture & Food, Communications, Construction & Architecture, Consulting, Education, Engineering, Banking & Finance, Government, Manufacturing durables, Manufacturing non-durables, Marketing & Advertising, Oil Industry, Retail/ & Wholesale & Distribution, Other

10. Can you give a specification of this segment?

> Open textbox

11. What is the size of the company?

> Choices: Large (>250 people), SME (<250 people)

12. What is the annual turnover of the company?

> Xxx,xxx,xxx.-- euro

13. What is the organisational form of the company?

> Choices: functional organisation, matrix organisation, project organisation, division, network

Only fill in if company is in manufacturing:

14. What is the principle of production of the company?

> Choices: design-to-order, engineer-to-order, manufacture-to-order, assembly-to-order, produce-to-stock

3. Enterprise System (Implementation Project) Characteristics

This section contains questions to characterise the Enterprise System as well as the implementation project. These questions should be answered by the project manager or someone else involved in the project.

Questions

15. What is your role within the implementation project

> Choices: Project manager, IT specialist, Business analyst, Change manager/ trainer, Key user (part of the project), End user (only involved at the end of the project or not at all), User line manager, Project sponsor, Senior manager, IT manager, Consultant, System vendor, Managing Director, Project manager, External trainer, Helpdesk, other

Enterprise system details:

16. Do you have previous experiences on implementing an Enterprise System?
Yes/no. If yes, which system and what were these experiences?

17. What are the reasons for implementing the Enterprise system?

> Choices: dictated by the holding, demand of important customers, planned benefits, response to competition/market forces, response to legislation, necessary for competition, other reason namely…

18. What is the application name of the Enterprise system?

> Open textbox

19. What is the version of the application?

> Open textbox

20. What is the name of the supplier of the application?

> Open textbox

21. What type of Enterprise system is it?

> Choices: ERP, PDM, CRM, Other

22. What is the platform type?

> Choices: mainframe, client-server, PC, Web-based

23. Which modules are being implemented?

If ERP then

>Choices: 1. Economy/financial: financial management, controlling treasury, executive information system, business information warehouse. 2. Logistics: material management, production planning, sales, distribution. 3. Other: plant maintenance, human resources, quality management, project management module, workflow, enterprise information management system (EIM), executive management system, other

If PDM then

>Choices: 1. Data vault and document management, 2. Change management, 3. Workflow and process management, 4. Product structure management, 5. Configuration   management, 6. Parts management, 7. Project and program management, other

If CRM then

>Choices: Relationship administration, Business to consumer, Completely web enabled, Data mining, Location-oriented Sales, Fulfilment, Campaign management, Call management, Field sales support, Channel management, E-mail merge selection, Forecasting, Product configuration, Loyalty management, other

If other then

>what modules does the system have and which ones are implemented?

24. What is the system development technology of the Enterprise system?

>Choices: new system-package solution, new system-bespoke development, upgrade existing system, other (more than one choice is possible)

25. Does the Enterprise system integrate with existing system(s)?

>Choices: yes or no, if no then ask why

26. Does the system have interfaces with other systems?

>Choices: yes or no, if yes then ask what interfaces

Implementation project details:

27. What has been the planned duration of the implementation project?

>Xx months

28. If finished: What has been the real duration of the implementation project?

>Xx months

29. What budget was planned for the project?

>a. How many people resources did you plan to spend on the project?
>
>>Xx months, Xx person days planned resource effort
>
>b. How much money did you budget to spend on the project in total?
>
>>Xxx,xxx.- euro
>
>c. Can you split these costs into the following groups?
>
>>Xxx,xxx.- euro hardware
>>Xxx,xxx.- euro software/licences
>>Xxx,xxx.- euro project staff
>>Xxx,xxx.- euro other staff (users/management)
>>Xxx,xxx.- euro support (helpdesk, IT operations, network support)
>>Xxx,xxx.- euro training
>>Xxx,xxx.- euro other third parties (consultants, hosting, facilities management)

30. If finished: Did the project finish within budget limits?

>Yes, No

>If no: What has been the budget overrun for the project?

>>a. People resources?
>>
>>>Xx months, Xx person days resource efforts
>>
>>b. Money spent on the project in total?

Xxx,xxx.- euro

    c. Can you split these costs into the following groups?

        Xxx,xxx.- euro hardware
        Xxx,xxx.- euro software/licences
        Xxx,xxx.- euro project staff
        Xxx,xxx.- euro other staff (users/management)
        Xxx,xxx.- euro support (helpdesk, IT operations, network support)
        Xxx,xxx.- euro training
        Xxx,xxx.- euro other third parties (consultants, hosting, facilities management)

31. What kind of implementation approach do you use?

    Choices: Big-bang (one-time implementation across all units), evolutionary (starting with a part of the system in one or more units), pilot (full implementation in one or more units), other

32. Did you have one implementation approach for each module of the ES?

    Choices: for all modules the same, different for each module

33. Did you define success criteria at the start of the project (SMART objectives – Specific, Measurable, Achievable, Relevant, Time bound)?

    Choices: yes, no

    If yes: What are the defined success criteria

        Open textbox

    If no: What benefits did you anticipate the project would deliver?

    Choices: increased sales, new product/service, reduced costs, reduced effort, reduced resources, reduced time, other namely…

34. If finished: Has the project achieved anticipated benefits?

    Choices: yes or no

35. If finished: What are the achieved benefits?

    Open textbox

36. Did you model the process prior to implementation?

    Choices: yes, no

37. Did you map the existing processes towards the new process?

    Choices: yes, no, not applicable

38. Did you map an entirely new process backwards to the existing process?

    Choices: yes, no, not applicable

39. Did you use a modelling tool to document this process?

    Choices: yes, no, if yes then ask what tool: open textbox

40. Did you use a tool to configure the business processes aligned to ES?

    Choices: yes, no

Only fill in if company uses a tool (question 41 – 43):

41. Was the tool supported by the consultant or vendor?

    Choices: yes, no

42. What was the name of the tool?

    Open textbox

43. What was the content of the tool or approach?

    Open textbox

44. In which phase is the implementation project now

    Choices: Concept phase, Initiating phase, Mobilisation phase, Deployment phase, Project close phase, Operation phase.

45. Which parties are part of the implementation project?

Choices: Senior management, End-users, Consultant (third party), Suppliers, Clients, all departments **or choose departments**: IT-department, Marketing/Sales, R&D, Purchase & Logistics, Production, Production planning, Service & Maintenance, Finance, Human Resource, Other

46. Which additional parties are involved in (but not directly part of) the implementation project?

    Textbox

47. If a consultant (third party) is involved in the project: What is the name of the consultancy and what role did they have?

    Open textbox

Use information

48. How many employees will use or are using the Enterprise system?

    xx employees

49. Which departments will use or are using the Enterprise system?

    Choices: Top management, all management, IT-department, Marketing/Sales, R&D, Engineering, Purchase & Logistics, Production, Production planning, Service & Maintenance, Finance, Human Resource, Other

50. How many users are external users (e.g., clients, suppliers)?

    xx % of the users

51. If there has been a pilot implementation: How many users did it involve?

    xx % of the users

52. If there has been a pilot implementation: What have been areas of concern or success within the implementation project?

    Open textbox

53. If finished: Do you consider the implementation project a success?

    Choices: yes or no + explanation why (open textbox)

54. If finished: Are there still activities going on for adapting the Enterprise system?

    Choices: yes or no

4. Impact on business process

This section contains questions on the impact on the business processes. These questions can be answered by a project manager or a functional manager.

Questions

55. What is the opinion in the organisation about the Enterprise system?

    Choices: rate of 1 – 5, 1 is excellent and 5 is terrible

56. Have you identified any desires to improve the Enterprise system?

    Choices: yes or no, if yes then: what kind of improvements?

57. Are other IT systems being used besides the enterprise system?

    Choices: yes or no, if yes then what systems?

58. Which functions of the ES are mainly used?

    Open textbox

59. Have the business processes changed due to the Enterprise system?

    Choices: yes, no, if yes then: what has changed?

60. Have the tasks become more or less challenging/interesting?

    Choices: more, less

61. Has the Enterprise system increased collaboration and social contacts?

> Choices: yes or no, if yes then: in what way?

62. Has the Enterprise system changed end user responsibilities?

> Choices: yes or no, if yes then: increased, decreased, same level but different

Training

63. Have the end-users received training for working with the Enterprise system?

> Choices: yes or no

64. If training has been received: When was the training received?

> Choices: before implementation, during implementation, after go-live, if choice is before or after, then: How long before/after the implementation did you receive training?

65. What form of training was received?

> Choices: classroom training, workshop/seminar training, at desk instruction, online training, reliance on manuals, online help, other

66. From whom was training received?

> Choices: colleague, key user, in-house IT Trainer, external trainer, other

67. Was training material provided?

> Choices: yes, no, if yes then: what material?

68. Was the training mainly technical?

> Choices: yes, no,
> if yes then: screen sequences, navigation, other
> if no then: what other subjects were trained?

69. Does the application include any help pages or help text?

> Choices: yes, no

Do you want to join the Industrial Support Group?

The Industrial Support Group is created in order to identify those companies that can contribute and help, through their experiences, to guarantee the high quality of the project. The BEST project methodology and diagnostic tool will be developed based on the experiences of the companies involved in the Industrial Support Group. Thus, assuring that the final result of the project is based on the real needs of European companies. The Industrial Support Group is made of European companies such as:
- Suppliers and systems developers
- Companies that have implemented Enterprise Systems
- Companies that are in the Enterprise System planning or implementation phases

The advantages of belonging to the Industrial Support Group are numerous:
- access to the project results,
- invitations to take part in workshops, presentations and meetings,
- discount in the inscription quota for events organized by the members of the consortium,
- recognition as associated company the BEST project, which bears a great diffusion and attention in press and specializing means,
- access to the results of the case studies,
- opportunity to exchange experiences and information with European experts,
- opportunity to exchange experiences and information with colleagues and European companies

The members of the group of industrial support will help (always according to time and available resources in the organization) to the development of the project BEST, through:
- facilitating the necessary information to analyse the situation in the region,
- contributing in the case studies,
- sharing methodologies and knowledge with the consortium (confidential information only for use of the consortium for the project),
- giving opinion about the ideas and results of the project.

Choice: Yes/no

Thank you very much!

APPENDIX C: INITIAL REFERENCE FRAMEWORK USED IN THE LITERATURE ANALYSIS[20]

	Enterprise System	Enterprise System Implementation	Project Management	Change Management	Business
Strategy and Goals	what is the scope, architecture strategy		clear project goals fit to business	change driver	volatility, business goals
Management			prioritisation in business	creating coalitions	
Process	synchronize/align ES + B configuration	implementation approach	risk mngt, controlling, project planning	planning, phasing	scope affected
Communication and motivation	designer + business representative	Who is involved	how to make project mngt. plan known	how to make CM plan known	how to communicate and motivate staff
Training	ES training, stage of training, adapted to target groups	ES implementation training, stage of training	training of PM	CM training, stage of training	organisation training, stage of training
Structure	integration with other systems	implementation team	leadership role, team balance, team composition	CM team, CM champion	new process structure
Culture			leadership style	CM style, adaptive to change	project fit business
Knowledge and skills	understanding of the fit between ES and B	understanding of implementation approach,	understanding PM, applying PM	understanding CM, applying CM	understanding B, using ES to fit B
Commitment		degree of commitment	degree of commitment	degree of commitment	alignment of competition between projects
Resources	people with the right knowledge and tools (ES fit B), system maturity		can the IT people and B people work together, adequate resourcing	seniority of sponsor, CM methods	availability of resources

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[20] From Wognum, N., Mensink, G., Warne, C., Bühl, H., Lombardo, S., Ma, X., Sedmak-Wells, M., Lisanti, B. and Kenett, R. (2004), 'Report 2.7: Case study analysis', Doc. Ref. No.: BEST_WP2_R2.7_20040119_V02, pp. 1-48.

The reference framework is populated with questions based on the case study examples, for clarification of the fields.

	Project Management	Business	Enterprise System
	Category	**Category**	**Category**
Strategy & goals	information strategy not available, top management requirements for reducing risks in contract management, presence of information strategy and contract design	ES is seen as a tool for change, new contact with customer created need for ES, cross-organisational exchange by common classification /terminology, higher efficiency by integration of different system functions, lower implementation costs with new ES	is there a clear goal for ES, to what extent does the strategy for system design take into account the end user needs
Management	project management style (high involvement, dealing with details), decision to communicate and collaborate with the vendor/consultant	priority of project in business concerning time, budget and people resources, limited project time which means the operation phase is not supported	x
Structure	selection of team (project manager has to understand who has interest in the project) , core team extended team, parties from inside and outside company (client, vendor, consultant, third party, suppliers)	business structure is tuned to operating ES, business reorganisation during ES implementation affecting ES, changing business processes and technology impact ES choice	match (fit) between system and business, choice of right system, thinking of architecture/ functionality
Process	no external consultant support for the change, identification and involvement of the owners of the existing processes, bad timing	x	match the system to needs, process to transform data from old to new system, tuning between functions, integration with other systems (process), testing the system, solving problems in configuration process
Knowledge & skills, resources	sufficient knowledge of the system (planning training, project management responsibilities), right skills in project team (from involved people), lack of time and experienced project members, most project members are part time available, time for project	negative experience with ES implementation or with consultants, knowledge of the system, system features or implementation project, knowledge of changes needed in business process and consequences for ES and advantages of changes; no people available because production	whether the vendors/consultants/who ever is implementing are competent to implement system; relationship between analysing the ES design tasks (database development, requirements definition) and allocating the time
Social dynamics	x	end user are afraid of change (too much change in organisation), middle management don't want to spend time	whether the vendor is flexible and supportive in changes

[21] Wognum, N., Mensink, G., Warne, C., Bühl, H., Lombardo, S., Ma, X., Sedmak-Wells, M., Lisanti, B. and Kenett, R. (2004), 'Report 2.7: Case study analysis',
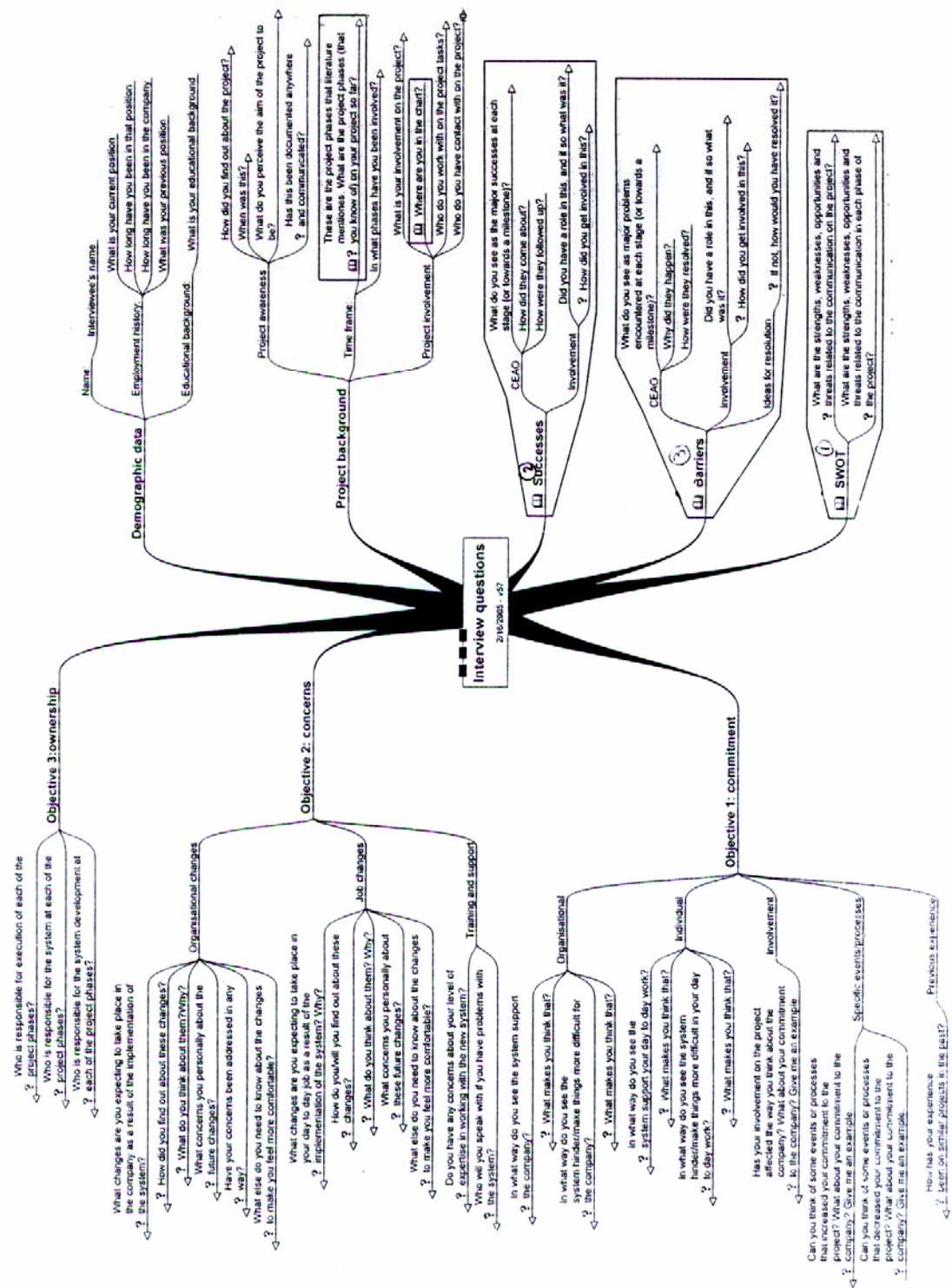Doc. Ref. No.: BEST_WP2_R2.7_20040119_V02, pp. 1-48.

APPENDIX E: INTERVIEW STRUCTURE

Interview questions — 2/16/2005 - v57

Demographic data
- Name
  - Interviewee's name
- Employment history
  - What is your current position
  - How long have you been in that position
  - How long have you been in the company
  - What was your previous position
- Educational background
  - What is your educational background

Project background
- Project awareness
  - How did you find out about the project?
  - What do you perceive the aim of the project to be?
  - When was this?
  - Has this been documented anywhere and communicated?
- Time frame
  - These are the project phases that literature mentiones. What are the project phases (that you know of) on your project so far?
  - In what phases have you been involved?
- Project involvement
  - What is your involvement on the project?
  - Where are you in the chart?
  - Who do you work with on the project tasks?
  - Who do you have contact with on the project?

Successes (2)
- CEAO
  - What do you see as the major successes at each stage (or towards a milestone)?
  - How did they come about?
  - How were they followed up?
- Involvement
  - Did you have a role in this, and if so what was it?
  - How did you get involved in this?

Barriers (3)
- CEAO
  - What do you see as major problems encountered at each stage (or towards a milestone)?
  - Why did they happen?
  - How were they resolved?
- Involvement
  - Did you have a role in this, and if so what was it?
  - How did you get involved in this?
- Ideas for resolution
  - If not, how would you have resolved it?

SWOT (1)
- What are the strengths, weaknesses, opportunities and threats related to the communication on the project?
- What are the strengths, weaknesses, opportunities and threats related to the communication in each phase of the project?

Objective 3: ownership
- Who is responsible for execution of each of the project phases?
- Who's responsible for the system at each of the project phases?
- Who is responsible for the system development at each of the project phases?

Objective 2: concerns
- Organisational changes
  - What changes are you expecting to take place in the company as a result of the implementation of the system?
  - How did you find out about these changes?
  - What do you think about them? Why?
  - What concerns you personally about the future changes?
  - Have your concerns been addressed in any way?
  - What else do you need to know about the changes to make you feel more comfortable?
- Job changes
  - What changes are you expecting to take place in your day to day job as a result of the implementation of the system? Why?
  - How do you/will you find out about these changes?
  - What do you think about them? Why?
  - What concerns you personally about these future changes?
  - What else do you need to know about the changes to make you feel more comfortable?
- Training and support
  - Do you have any concerns about your level of expertise in working with the new system?
  - Who will you speak with if you have problems with the system?

Objective 1: commitment
- Organisational
  - In what way do you see the system support the company?
  - What makes you think that?
  - In what way do you see the system hinder/make things more difficult for the company?
  - What makes you think that?
- Individual
  - In what way do you see the system support your day to day work?
  - What makes you think that?
  - In what way do you see the system hinder/make things more difficult in your day to day work?
  - What makes you think that?
- Involvement
  - Has your involvement on the project affected the way you think about the company? What about your commitment to the company? Give me an example
- Specific events/processes
  - Can you think of some events or processes that increased your commitment to the project? What about your commitment to the company? Give me an example
  - Can you think of some events or processes that decreased your commitment to the project? What about your commitment to the company? Give me an example
- Previous experience
  - How has your experience been on similar projects in the past?

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APPENDIX F: LITERATURE ANALYSIS REFERENCES

CASE STUDY LITERATURE

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Initial validation

The instructions were given in an email to the first expert to read through the tabulated data collected at the interviews at Drillco. Then, the expert was instructed to look at the causes of communication events and put them into three to five categories, and to do the same for the communication events themselves. She was given the option of having different categories between the two groups. The instructions included the statements that:

1. The causes from the table should be coded according to the content.

2. The events should be coded according to the reason for or meaning of their occurrence.

An additional meeting was scheduled to understand the expert's classification better, as she did not provide an explanation of the categories.

The expert read all the communication events together first and classified them into groups. She then read through the causes for the communication events and classified those.

Classification of communication events

Her classification of the events was based on the project phases, which seemed obvious to her. She suggested the reason for this to be the fact that she was involved in implementation projects and was very knowledgeable about the implementation methodology that was used in the consulting company she worked for.

The categories she identified for the classification of the communication events were:

1. Communications to define system requirements - top level system definition at the scoping stage.

2. Communication to formally agree the project contract - agreeing the contractual implementation obligation and securing the budget. The expert perceived this to be related to the contractual issues in setting up and running the project.

3. Communications concerned with system development – this category was seen by the expert to be an 'anomaly' as she classed only one event here. This category included trying and testing various new functionalities on the dummy system and developing it.

4. Communication of the system to the company – this was the aspect of the implementation in which the system that was being developed was announced and presented to the employees. This also includes the training aspect because the training is *"communication when you're showing the new system and its capabilities".*

Table 14 compares the categories of communication events that this author developed with the categories developed by the expert, based on Table 10, presented in Section 6.1.4.1.

No.	Communication event	Category [author]	Category [expert]
1	Discussion with the System Developer about the requirements for the future and how the old systems would not meet them, about developing new system, about costs and possibility and practicality of time scales	Strategy	Communications to define system requirements
2	The meeting to propose the plan and list costs, timescales, investment and final product and to assess needs and desires for such a new system among the consortium members	Management	Communication to formal agree project contract
3	The meeting to ask the company team if they were prepared to enter into developing this new system with the System Developer	Management	Communication to formal agree project contract
4	Announcement of the new system to the team [same as 3 above]	Management	Communication of system to company
5	Use of dummy system to trial and test and working and discussing the system with colleagues	Technical Knowledge Exchange	Communications concerned with system development
6	Training	Technical Knowledge Exchange	Communication of system to company
7	Verbal request as to my needs/requirements of the system to enable me to work more effectively	Technical	Communications to define system requirements

Table 14: The comparisons of categories of communication events developed by this author and the expert

The expert categorised the discussion about the system requirements with the Developer and the request for end user system requirements in the same category of communication to define system requirements (1 and 7 in Table 14). However, she distinguished between them as being on the higher level and more individual level. This author categorised the higher level communication about system requirements to be related to strategy, as this communication event included the assessment of the current system and future requirements of an IT system in place. The individual level requirements were classified as being related to technical communication about the details of the system.

The expert also classed meetings with the consortium members and meetings with the company staff as communication to formally agree the project contract (2 and 3 in Table 14). To the author, these issues were classed within the category related to management issues. These communication events as activities were performed by the company management in order to manage the project. The announcement of the new system was classed within the category of management, as this, again, was the activity performed by the management in order to manage the project (4 in Table 14). However, the expert classed this within the category of communication of the system to the company. This classification then depends on the point of view from which the

announcement of the system is looked at – from the management perspective or from the end user perspective.

The 'anomaly' communication event of the use of the dummy system and discussion about the system among the users was classed by the expert to be communication concerned with system development (5 in Table 14). However, the author classed the event as having the purpose of technical knowledge exchange between the users. So whereas the expert saw the discussion between the users to be undertaken in order to develop the system, the author saw it in terms of its purpose, which was the exchange and increase in technical knowledge of the users. In this case, too, the classification depended on the point of view, the system point of view – developing the system, or the user point of view – the increase in technical knowledge.

Finally, training was seen by the author to be an opportunity for technical knowledge exchange, this time between the System Developers and the users (6 in Table 14). However, the expert classed this communication event as being one of communication about the system to the company. Again here, the difference in classification comes from adopting a different point of view. The opportunity for technical knowledge exchange again is between the users and the instructors, whereas the communication of the system to the company comes from the system point of view where the system is being communicated to the users.

Classification of causes for communication events

The expert classified the causes for communication events in isolation from the events that they had caused. She read through the table with the chain of events focusing only on causes and tried to group them. Following this, she classified the causes within each category under separate headings. This time, the classification was not related to the sequential project lifecycle as in the case of communication events.

The categories that the expert created were

1. Current system limitations:
   a. technical
   b. aesthetic
2. Future system definition:
   a. budgets
   b. requirements
   c. support
3. Future system implementation:
   a. requirements definition
   b. project event

It should be noted that the expert did not know when the go-live date was, so what she termed as the current system was in fact the previous MS DOS based system. Similarly, what was termed as the future system in this classification was in fact the current company system, as the go-live date was prior to data collection. The original terms were kept for authenticity.

The expert divided the category of current system limitations into two subcategories: technical limitations and aesthetical limitations. The technical limitations related to the technology used being obsolete. In the other subgroup were the aesthetic limitations of the systems, which were not technical in nature, but the system, or rather the system output, did not look the way the company wanted it to look, i.e. it looked old fashioned and it made the company look old fashioned.

The second group of causes included those related to the definition of the future system. This included defining the budget for the system, and defining the requirement, and the support for the system.

The third group defined by the expert was named future system implementation. It included detailed definition of the requirements, as well as what the expert termed a project event. The main difference between 2b and 3a is related to the time within the project lifecycle when the system requirements are defined. The 2b definition is performed at the time of system scoping, while the 3a definition is done further on in the implementation process while the system is being developed, after the company has entered into the contract. A project event, for example the installation of the dummy system, included the events that would be a milestone in the project plan.

Table 15 compares the categories of causes for communication events that this author developed with the categories developed by the expert, based on Table 11, presented in Section 6.1.4.2.

Causes classed by the expert to be technical system limitations were those related to the technical problems linked to the new Windows platform which could not be used, and the lack of further evolution of the old MS DOS system (4 and 5 in Table 15). This author saw the causes to be of a technical nature. The aesthetic limitations of the system as termed by the expert were related to the system output, e.g. invoices, which made the company look old fashioned (11 in Table 15). This author classed the cause to be related to company image, rather than to the system.

The cause perceived by the expert to be related both to the financial and technical requirements aspect of definition of the future system related to the need for investors to fund the new system development (1 in Table 15). However, this author classified the cause in the category related to the top management's strategy as to how to fund further and run the project.

No.	Causes for communication events	Category [author]	Category [expert]
1	Needed other investors and broader opinion of what would be needed in a new system of this type to ensure it could be generic	Strategy	Future system definition – budgets & requirements
2	Wanted a new system but could not afford the £100k alone.	Management	Future system definition - budgets
3	System Developer has previously caused problems through lack of support or being contacted at urgent times due to him being the only support for the old system,	Resources	Future system definition - support
4	Implementation of 2000 + XP MS DOS programs cause problems, so it was necessary to downgrade to Win 98.	Technical	Current system limitations - technical
5	MS DOS System changes, new developments, were becoming difficult as screens were full & didn't allow new fields.	Technical	Current system limitations - technical
6	After looking at other systems realising they were not user friendly for the requirements	Technical	Future system definition – requirements
7	New computer system installation	Technical	Future system implementation - requirements definition
8	Installation of dummy system	Technical	Project event
9	Installation of computer system	Technical	Project event
10	Pending installation of new software in Nov 2004	Technical	Project event
11	Windows was operating system of all modern systems – the company looked old fashioned.	Image	Current system limitations - aesthetical

Table 15: The comparisons of categories of causes for communication events developed by this author and the expert

Another cause that was classified by the expert in the category related to the budget for the future system was the fact that company could not afford to fund the system development alone (2 in Table 15). For this author, this cause relates to the actions of management and the awareness of the financial situation of the company.

Another cause classed in the requirements for the definition of the new system was the investigation of other systems as options to implement, and looking at how user friendly they were (6 in Table 15). This was classed by this author to be a technical

matter. The only cause of a communication event that the expert classed in the category for the support in future system definition group was the one relating to the availability of the System Developer (3 in Table 15). This author classed the cause in the resource category, as it is related to the past and future availability of resources to support the users and the system.

The final category of future system implementation included the causes related to requirements definition – the installation of the new computer system, which resulted in the communication event of the users being asked what their requirements were (7 in Table 15). The other subcategory termed by the expert to be project events included similar causes related to the implementation of the system and the dummy system (9, 10 and 8 respectively in Table 15). All the causes were classed as technical causes of the communication events.

Initial validation findings

From the initial validation certain conclusions can be drawn. When the classification categories were compared, it was found that they were different between the expert and this author. The difference resulted mainly from what the person classifying the data saw as the focal point of any single piece of data, i.e. the communication event. This seems to depend to some extent on their experience, as the expert, who had experience in using a particular methodology in implementing enterprise systems, and was always involved on the technical side of the implementation, took the perspective of the system into account. The classification of communication events in this case depended not only on the project phases which stood out to the expert, but also on seeing the system as one of the main focal points in some of the communication events, e.g. training. On the other hand, this author never took the system point of view, apart from on one occasion when the category was termed technical.

If classification of causes of communication events is examined more thoroughly, the expert again focused all the categories around the system, be it the old or the new, the limitations, definition or implementation. This author, on the other hand, had in mind the company management and its activities, users and resources when classifying the data, while the purely system related causes, including the assessment of alternative enterprise system packages, were all in the same technical category of causes.

In relation to the questions asked in Section 6.4.1, the answer to question 1 about the creation of the categories, the comparisons between the classification of the communication events suggest that different researchers would create different categories from the same data. The creation of the categories depends on the point of view from which every single event is viewed. This can be, for example, the point of view of the system, of the users, or of the management.

Question 2 related to the boundaries of the concepts being clear. This appears from the results not to be a problem. However, it should be noted that the number of categories was small and that there were seven communication events to be classified. In the case of causes of communication events, one of the causes was classed by the expert to fall into two categories. This also raises the question of how discrete the events and the causes are, and how many focal points might be in each of the statements given by the interviewees.

Question 3 related to the categorisation of the events in the same categories by different researchers. Considering that the different categories were developed by different researchers, this question could not be answered by applying the method applied in the initial validation.

Finally, question 4 related to the instructions that the researchers classifying the data need to have in order to classify them in the same way. The instructions in this case can only be deemed as insufficient and not directive enough, considering the difference in categories which were established.

Further validation

In order to find answers to question 1-4 in Section 6.4.1, it was necessary to go through another cycle of validation of the coding and classification process. In particular, the purpose was to answer question 1 relating to the creation of categories, and question 4 relating to the instructions given to the researcher classifying the data. In order to answer question 3 about the classification of the same data in the same categories, it was deemed necessary to go through another loop, with clear categories given to the researcher to replicate the data allocation process.

The person who took part in this part of the validation had not been involved in social science based doctoral research. However, he had completed an MSc degree on the reduction of stress levels in airline crew members in order to provide better service to customers.

The instructions given to the participant in further validation were more directive than in the initial validation. He was instructed to read the chain of events one by one to get a picture what they were about and understand the issues better. Then, the participants were to look at the communication events separately and categorise them into 3-4 groups according to the actors, management, users, external parties, system etc. and their actions. Then they were to read the causes column and group the causes into 3-5 groups as appropriate, according to actors, management, users, external parties, system etc. and what they do. The participants were instructed that there could be different categories between the two groups, that the events should be coded according to the purpose of their occurrence, and that the causes from the charts should be coded according to the content. Finally, they were instructed to put the codes next to the causes or events in the reference box, and then to write what they meant below the Cause-Event-Action-Outcome table, if there was insufficient space.

The participant did not follow the instructions too closely. He too did not read the whole chain of the Cause-Event-Action-Outcome, but read all the communication events together first and classified them into groups. He then read through the causes for the communication events and classified those.

Classification of communication events

The participant developed the categorisation based on the instructions that were given and who the communication event involved or affected. The categories included the management, users and external parties.

Table 16 compares the categories of communication events that this author developed with the categories developed by the expert, based on Table 10 presented in Section 6.1.4.1.

No.	Communication event	Category [author]	Category [expert]
1	Discussion with the System Developer about the requirements for the future and how the old system would not meet them, about developing the new system, about costs and possibility and practicality of time scales	Strategy	User
2	The meeting to propose the plan and list costs, timescales, investment and final product and to assess needs and desires for such a new system among the consortium members	Management	User/External parties
3	The meeting to ask company team if they were prepared to enter into developing this new system with the System Developer	Management	Management
4	Announcement of the new system to the team [same as 3 above]	Management	Management
5	Use of dummy system to trial and test and working and discussing the system with colleagues	Technical Knowledge Exchange	External parties
6	Training	Technical Knowledge Exchange	User
7	Verbal request as to my needs/requirements of the system to enable me to work more effectively	Technical	User

Table 16: The comparisons of categories of communication events developed by this author and the expert in further validation

As the participant here was asked to classify the communication events according to the actors and their actions with greater direction from the researcher, this can be observed in the names of the groups used. The participant also allocated sequential numbers to the events as he thought they would take place chronologically. The participant was not required to complete this, but chose it as an additional classification. Considering that he did not have knowledge of system implementation, the sequence of communication events did not reflect the true sequence of events.

From Table 16 it can be observed that some of the categories between the participant and this author matched, particularly within the field of management (3 and 4 in Table 16). Furthermore, discussion with the System Developer was allocated to the user category as it was seen that the company as a user would be using the future system (1 in Table 16). The meeting to discuss project issues with consortium members was allocated to the user and external parties group, as the meeting was seen as an interaction between the company as a future user of the system and the System Developer as an external party (2 in Table 16). The use of the dummy system for

trialling and testing was allocated to the external parties group (5 in Table 16). The use of the dummy system was seen to be for the purposes of the System Developer benefiting from the trialling and testing of the system conducted by the users (6 in Table 16). Finally, training and requests from the user for system requirements were seen to fall purely within the user category (6 and 7 Table 16).

Classification of causes for communication events

The participant developed the categories for causes of the communication events based on the stages in the implementation process. The first stage includes the dissatisfaction with the current system, and he termed it abstract or emotional reasons. The second stage includes technical problems encountered and it was termed technical, while the third stage involves an organisational decision, so it was named the organisational category. The following phase includes technological and application problems or causes. The final stage was seen to be the installation of the system, as this was the point of go-live.

Table 17 compares the categories of causes for communication events that this author developed with the categories developed by the expert, based on Table 11 presented in Section 6.1.4.2.

It can be noted that there is a similarity between this author's strategy group and the organisational group of the participant, as this involves a decision at the organisational level (1 in Table 17). In the abstract group, there are two causes, both involving the desire or the motivation for things to change (2 and 11 in Table 17). The following group of technical reasons involves the technical limitations of the system as well as the software maintenance being a problem due to lack of support (4, 5 and 3 respectively in Table 17). The category related to the technological or application aspect of the system includes the decision that other systems were not user friendly and the installation of the dummy system (6 and 8 respectively in Table 17). Finally, the installation of the new system was seen by the participant to be the final stage category, as this was the point of go-live according to the participant's understanding (7, 9 and 10 in Table 17).

No.	Causes for communication events	Category [author]	Category [expert]
1	Needed other investors and broader opinion of what would be needed in a new system of this type to ensure that it could be generic	Strategy	Organisational
2	Wanted a new system but could not afford the £100k alone	Management	Abstract
3	System Developer has previously caused problems through lack of support or being contacted at urgent times due to him being the only support for the old system	Resources	Technical
4	Implementation of 2000 + XP MS DOS programs cause problems, so it was necessary to downgrade to Windows 98	Technical	Technical
5	MS DOS system changes, new developments, were becoming difficult as screens were full and didn't allow new fields	Technical	Technical
6	After looking at other systems realising they were not user friendly for the requirements	Technical	Technological application
7	New computer system installation	Technical	Final stage
8	Installation of dummy system	Technical	Technological application
9	Installation of computer system	Technical	Final stage
10	Pending installation of new software in Nov 2004	Technical	Final stage
11	Windows was operating system of all modern systems – the company looked old fashioned.	Image	Abstract

Table 17: The comparisons of categories of causes for communication events developed by this author and the expert in further validation

Further validation findings

Certain conclusions can be drawn from further validation. When the classification categories were compared, as in the case of the initial validation, it was found that they were different for the participant and for this author. Here again, the difference between the categories of communication events resulted from what the person classifying the data saw as the focal point of any single piece of data. So, the individual users and the company as a user of the system were in the same category. As the participant was asked to classify data according to particular actors of the events, this was transparent in the categorisation. In contrast to the first expert, this participant did not see the system as an actor. This was only in slight contrast to this author, who took the system point of view on one occasion, when the category was termed technical.

In terms of classification of causes of communication events, the participant focused the categories around what seemed to him to be the chronological occurrence of causes. This author, on the other hand, had in mind the company management and its activities, users and resources, when classifying the data, while the chronological manifestation of the causes was not considered in the classification process.

In terms of the answers to questions asked in Section 6.4.1, one can come to similar conclusions as in the initial part of the validation. In answer to question 1 about the creation of the categories, the comparisons between the classification of the communication events suggest that different researchers would create mainly different categories from the same data, with some categories matching, when the instructions are more directive. The creation of the categories depends on how the person creating the categories views the whole set of data in relation to the instructions. However, in the case of causes of communication events, where the instructions were less directive, the chronological perspective took priority.

Question 2 related to the boundaries of the concepts being clear. This appears from the results not to be a great problem. However, one of the events was classified in two categories. It should be noted that the number of categories was small and that there were seven communication events to be classified. In the case of causes of communication events, all of them were classified in different categories.

Question 3 related to the categorisation of the events in the same categories by different researchers. It should be noted that different categories were developed by different researchers, but that there was some alignment between the categories present both within the categories of communication events and their causes. This question could not be fully answered by applying the method applied in the further validation as the instructions did not seem to achieve the purpose of being directive enough for the same categories to be formed by different participants.

Finally, question 4 related to the instructions that the person classifying the data needs to have in order to classify them in the same way. The instructions in this case, although being more directive than in the initial validation, were not directive enough for the same categories to be created by different participants. However, the improvement in alignment between categories can be noted.

Final validation

In order to find more thorough answers to questions 1-4 in Section 6.4.1, it was necessary to go through another cycle of validation of the coding and classification process. To enable the answering of question 3 about the classification of the same data in the same categories, it was deemed necessary to go through an iteration with clear categories given to the researcher to replicate the data allocation process. Question 2, relating to the boundaries of the concepts being clear, would provide answers related to this author's categories and how clear the boundaries were, as opposed to how clear the categories of the previous validation participants were, in initial and further validation. To answer question 4, relating to the instructions given to the researcher classifying the data, the instructions in this case could only reflect the purely directive nature of the request. Finally, the creation of categories relating to question 1 was not relevant to this stage, as the expert was instructed which categories to use.

The instructions were given in an email to the expert who participated in the initial validation, to read through the tabulated chain of events one by one in order to get a picture of what they were about and to understand the issues better. Then, the expert was instructed to look at the communication events separately and categorise them into groups. The groups given as available for categorising were strategy related communication, management activities, technical and technical knowledge exchange. The categories' descriptions were given as follows: the strategy category includes strategy related communication; the management activities category includes activities performed by the management with the purpose of managing the project, company etc. The main difference between the technical knowledge exchange and the technical category was explained to be in the purpose of communication. The purpose of the former was given to be in improving the understanding and the use of the system, while the purpose of the latter is in increasing knowledge in order to build the system.

The expert was then instructed to move into the causes column and to group the causes into groups as appropriate. The groups given as available for categorising were:

- Strategy
- Management
- Resources
- Technical
- Image

Similarly to the groups of communication events, strategy was to include strategy related causes for communication. The management activities category should have included events performed by the management with the purpose to manage the project, company etc. The resources group should have related to the availability of time and people to be involved. The technical causes should have included the technical – system related issues as causes of communication. Finally, image should have included the externally portrayed impression that the company gives to the outside world and causes of communication related to that.

The expert was then asked to put the codes next to the causes or events in the reference box, and then to write what the codes meant below the table.

The expert did not follow the instructions too closely. She did not read the whole chain of the Cause-Event-Action-Outcome due to time restrictions, but read all the communication events together first and classified them into groups. She then read through the causes for the communication events and classified those.

Classification of communication events

The expert used the categorisation based on the instructions that were given. The categories included the strategy, management, technical knowledge exchange and technical groups.

Table 18 compares the classification of communication events performed by this author to that done by the expert, based on Table 10 presented in Section 6.1.4.1.

No.	Communication event	Category [author]	Category [expert]	Secondary theme [expert]
1	Discussion with the System Developer about the requirements for the future and how the old systems would not meet them, about developing new system, about costs and possibility and practicality of time scales	Strategy	Strategy	Technical
2	The meeting to propose the plan and list costs, timescales, investment and final product and to assess needs and desires for such a new system among the consortium members	Management	Management	Technical
3	The meeting to ask the company team if they were prepared to enter into developing this new system with the System Developer	Management	Management	
4	Announcement of the new system to the team [same as 3 above]	Management	Management	
5	Use of dummy system to trial and test and working and discussing the system with colleagues	Technical Knowledge Exchange	Technical	Technical Knowledge Exchange
6	Training	Technical Knowledge Exchange	Technical Knowledge Exchange	
7	Verbal request as to my needs/requirements of the system to enable me to work more effectively	Technical	Technical	

Table 18: The comparisons of classification of communication events into the categories by this author and by the expert

As can be noted from Table 18, the expert categorised six out of seven communication events in the same category as this author. The event which was categorised differently is the use of the dummy system for trialling and testing, and discussing the system with colleagues (5 in Table 18). The reason for classifying this event in the technical category was because it is related to exploration and knowledge acquisition to enable the System Developer to build the system.

An additional observation by the expert was that with some of the communication events there appeared to be a secondary theme coming through. These are presented in the last column in Table 18. The communication event number 1 was classified as a strategy event, but it included discussions on requirements for a future system. For this reason the expert added technical as a secondary theme. Event number 2 was classed as a management activity, but again it included technical requirements capture, which falls within the technical category, which was then chosen as a secondary theme. Use of dummy system (5 in Table 18) in addition to being technical, as a secondary theme has technical knowledge exchange, as the communication event also included consolidating the technical knowledge both by users and developers in order to use the system.

Classification of causes for communication events

The expert classified the causes of the communication events based on the categories she was given in the instructions.

Table 19 compares the classification of causes for communication events by this author with the classification performed by the expert, based on Table 11 presented in Section 6.1.4.2.

It can be noted from Table 19 that the expert classified all the causes of communication events in the same category as this author, apart from the ones relating to the installation of the new system or the dummy system. She commented that those causes could have been interpreted as management causes or technical causes. They could have been classed as technical as they involve a technical activity. However, she decided to classify them into the management causes group because although they were technical activities, in her 'world view' of systems implementation, she would expect those activities to be major project milestones, and thus related to management.

No.	Causes for communication events	Category [author]	Category [expert]
1	Needed other investors and broader opinion of what would be needed in a new system of this type to ensure it could be generic	Strategy	Strategy
2	Wanted a new system but could not afford the £100k alone	Management	Management
3	System Developer has previously caused problems through lack of support or being contacted at urgent times due to him being the only support for the old system	Resources	Resources
4	Implementation of 2000 + XP MS DOS programs cause problems, so it was necessary to downgrade to Windows 98	Technical	Technical
5	MS DOS system changes, new developments, were becoming difficult as screens were full and didn't allow new fields	Technical	Technical
6	After looking at other systems realising they were not user friendly for the requirements	Technical	Technical
7	New computer system installation	Technical	Management
8	Installation of dummy system	Technical	Management
9	Installation of computer system	Technical	Management
10	Pending installation of new software in Nov 2004	Technical	Management
11	Windows was operating system of all modern systems – the company looked old fashioned	Image	Image

Table 19: The comparisons of classification of causes for communication events into the categories by this author and by the expert

Final validation findings

Certain conclusions can be drawn from the final validation. This time, unlike in the initial and further validation, the expert was instructed to use the categories used by this author. Here again, as in previous validation cases, the difference between the allocation of data to the categories of communication events results from what the person classifying the data saw as the focal point of any single piece of data. So, the user's and the System Developer's point of view can affect the classification of data, depending on which one is taken.

In the case of classification of causes of communication events, the difference was found in understanding the terminology that the interviewees used. When they were referring to the installation of the new system, they were referring to the overall project, rather than the point of system going live. This point of view of the interviewees could have only become apparent to the expert by reading the whole table of the chains of events, if at all. For this reason the cause was seen as an activity performed by the management as a project milestone, rather than the overall technical side of system installation and going live, as it was seen by this author.

If the questions in Section 6.4.1 are addressed, the distribution of the answers changed according to the more directive instructions that the expert was given. Regarding question 1 about the creation of the categories, due to the categories given to the expert, this question was not addressed.

Question 2 related to the boundaries of the concepts being clear. Based on the classification of the communication events, and the existence of the second theme in three cases out of seven, it is deemed that the boundaries between the categories might not be as clear to every researcher not directly involved in this research. This implies that had the explanation of the categories been clearer, or the categories differently created, the boundary between the categories would have been stronger. In the case of causes of communication events, all of them were classified into single categories.

Question 3 related to the classification of the events in the same categories by different researchers. It can be noted that there was considerable alignment between the classification of both communication events and their causes performed by this author and the expert. The instructions achieved the purpose of being sufficiently directive for the same classification to be performed by different participants. The non-alignment was present in one out of seven communication events and seven out of eleven causes of communication events. The lack of alignment is explained in the sections above.

Finally, question 4 related to the instructions that the person classifying the data needs to have in order to classify them in the same way. The instructions in this case, as opposed to the instructions in the initial and further validation, were sufficiently directive as they included the names of the categories as well as their explanation.