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Strategic response in fragmented networks

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Strategic response in fragmented networks

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Abstract

Information explosion, globalisation and the reduction of trade barriers have led to the emergence of global production markets and broader access to a range of products for customers. For manufacturers this has led to managing fragmented networks to deal with more polarised markets with wider variety of products at reduced costs and shorter lifecycles in an increasingly competitive environment. This coupled with the pressure to create shareholder value calls for a dynamic approach in the design and management of their supply chains.

Market responsiveness is ability to anticipate and react purposefully within appropriate timescale to changes in the market place in order to maximise shareholder value and customer value. The aim of this research is to develop a model for market responsiveness that will enable organisations to deal with the changing needs of the market.

To achieve this aim the research methodology was designed to primarily collect qualitative evidence from three distinct supply chains within different industrial contexts. Contrasting across these contexts has helped to determine if the model is generic enough to be applicable in other contexts. The findings were that value gaps exist between interfaces within organisations and their supply chains. At such gaps value is either created, maintained or lost. Value gaps are the primary reasons why organisational tensions exist as the entities involved are focused on conflicting strategic objectives that lead to behavioural misalignment and ultimately poor response. Therefore the research concludes within a market responsiveness model within which there are frameworks for business performance management and managing the value execution point of which maximum shareholder value and customer value can be created.

Keywords:

Market responsiveness, supply chain management, performance management, competitiveness, strategic alignment

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To my Father in heaven who said to me, "*My grace is sufficient for you, for my power is made perfect in weakness.*"

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Abbreviations and Glossary

AR	Action research
ATO	Assemble to order
BOM	Bill of material
BPMS	Business Performance Management System
BPR	Business Process Reengineering
CDs	Compact Discs
CM	Customer Management
CSF	Critical success factors
EBIT	Earnings before interest and tax
ECO	Engineering change order
ETO	Engineer to order
FG	Finished goods
GM	Gross margin
HACCP	Hazard Analysis and Critical Control Points
HR	Human resources
IT	Information system(s)
JIT	Just-in-time
MTBF	Mean time between failure
MTF	Make to forecast
MTO	Make-to-order
MTS	Make to stock
MTTR	Mean time to repair
N/A	Not applicable
NPD	New product development
OEM	Original equipment manufacturer
OTIF	On time in full
PLC	Product Life Cycle
PPM	Parts per million
R&D	Research and development

RM	Raw Materials
S&OP	Sales and operations planning
SCM	Supply Chain Management
SKU	Stock keeping units
SMT	Senior Management Team
USP	Unique selling point
VEP	Value execution point
VM	Vehicle manufacturers
VMI	Vendor managed inventory

TERM	DEFINITION	SOURCE
Closed question	A question where respondents select the answer from a number of predetermined alternatives	(Hussey and Hussey, 1997)
Consumer touch points	Any facet of a company that interacts with consumers. E.g. products, advertising medium	(Millar, 2003)
Decoupling point	This is the point in the value adding processes where a product is linked to a specific customer order. Upstream from this point activities are forecast driven and downstream from this point activities are order driven	(Stevens, 1989)
Dependent variable	The variable whose values are predicted by the independent variable	(Hussey and Hussey, 1997)
Dialectic Critique	A way of understanding the relationships between the elements that makes up various phenomena in the context of an individual.	(Zuber-Skerritt, 1996)
Empirical evidence	Data which is based on observation or experience	(Hussey and Hussey, 1997)
Epistemology	A theory of knowledge; it presents a view and justification for what can be regarded as knowledge – what can be known, and what criteria such knowledge must satisfy in order to be called knowledge rather than beliefs	(Blaikie, 1993)
Extraneous variable	Any variable other than the independent variable which might have an effect on the dependent variable	(Hussey and Hussey, 1997)
HACCP	An internationally accepted system of	

	for food safety management. It is a preventative approach to food safety based on seven key principles.	
Hypothesis	A testable proposition (relevance – validity)	(Hussey and Hussey, 1997)
Independent variable	The variable that can be manipulated to predict the values of the dependent variable	(Hussey and Hussey, 1997)
Limitation	Any potential weakness in the research	(Hussey and Hussey, 1997)
Market segmentation	Heterogeneity in demand functions exist such that market can be disaggregated into segments with distinct demand functions.	(Dickson and Ginter, 1987)
Method	The actual techniques or procedures used to gather and analyse data related to some research question or hypothesis.	(Blaikie 1993)
Methodology	Is the analysis of how research should or does proceed	(Blaikie, 1993)
Natural setting	A research environment that would have existed had researchers never studied it	(Hussey and Hussey, 1997)
Ontology	The claims or assumptions that a particular approach to social enquiry makes about the nature of social reality	(Blaikie 1993)
Open question	A question where respondents can give a personal response or opinion in their own words	(Hussey and Hussey, 1997)
Order Qualifiers	Are those criteria which are necessary to be even considered by a customer as a possible supplier	(Hill, 1993)

Order Winners	Are those criteria which win the order	(Hill, 1993)
Performance Criterion	The relative element (such as parts per million defects and manufacturing lead time) used to evaluate macro- and micro-performance, long-term and short-term performance (accounting, manufacturing, etc.), and overall performance.	(Lockamy and Smith, 1997)
Performance standard	The accepted satisfactory level of performance.	(Lockamy and Smith, 1997)
Population	A population is any precisely defined set of people or collection of items which is under consideration.	(Hussey and Hussey, 1997)
Primary data	Original data which is collected at source, such as survey or experimental data	(Hussey and Hussey, 1997)
Product differentiation	A product offering is perceived by the consumer to differ from its competition on any physical or non-physical product characteristic including price.	(Dickson and Ginter, 1987)
Reflexive Critique	This is a process of the researcher becoming aware of their own perceptual biases.	(Zuber-Skerritt, 1996)
Repeaters	Products that are manufactured regularly to meet customer requirements or satisfy a recurring demand	Lucas industries
Research Methodology	This refers to the overall approach to the research process, from the theoretical underpinning to the collection and analysis of the data.	(Hussey and Hussey, 1997)
Research Methods	Refers to the various means by which	(Hussey and

	data can be collected and/ or analysed.	Hussey, 1997)
Risking disturbance	Understanding of the researcher's taken-for-granted processes and willingness to submit them to critique.	(Zuber-Skerritt, 1996)
Runners	Core products that are manufactured on a continuous basis and form a bulk of the volume in any given period	Lucas industries
Sample	A sample is a subset of a population and should represent the main interest of the study.	(Hussey and Hussey, 1997)
Secondary data	Data which already exists, such as books, documents and films	(Hussey and Hussey, 1997)
Strangers	Products that are manufactured to specific customer requirements on an irregular basis.	Lucas industries
Strategic Fit	Strategies with the same goals have strategic fit.	(Chopra, 2001)
Strategy	Strategy is a set of plans and policies by which a company aims to gain advantages over its competitors.	(Skinner, 1969)
Supply chain/ network	The supply chain is <i>the network of organisations</i> that are involved through <i>the upstream and downstream linkages</i> , in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer	(Christopher, 1998)
Synchronised demand management	'Synchronising the demand from the customer with the manufacturing plan with the flow of material from suppliers to reap substantial benefits by substituting information for inventory.'	(Stevens, 1989)

Theoretical framework	A collection of theories and models from the literature which underpins a positivistic research study	(Hussey and Hussey, 1997)
Theory	A set of explanatory concepts (relevance – usefulness)	(Hussey and Hussey, 1997)
Unit of analysis	The kind of case to which the variables or phenomena under study and the research problem refer, and about which data is collected and analysed	(Hussey and Hussey, 1997)
Variable	An attribute of an entity that can change and take different values which are capable of being observed and/ measured	(Hussey and Hussey, 1997)
Vertical Integration	Vertical integration normally implies the ownership of upstream suppliers and downstream customers.	(Christopher, 1998)

CHAPTER 1.**Introduction to the Research**

'I do not believe it is possible for Britain to trade its way into the future primarily as a service dominated economy... A robust manufacturing base is a crucial element in a modern competitive economy.' - Tony Blair (The Economist 15/06/1996)

The purpose of *Chapter 1: Introduction* is to:

- Introduce the reader to the research problem and the scope of the project.
- Present the structure of the thesis

1.1. Research Rationale

Key drivers for change in recent times are the reduction of trade barriers, explosion of information and globalisation. These have led to the emergence of global production markets and broader access to a range of products for customers and businesses.

For the consumer, the expanding range of available products mean that they are becoming more sophisticated in their purchases that *'are more than ever a reflection of a lifestyle or fashion statement rather than the satisfaction of a basic need'* (Lowson, 1999). This translates to the need for new/more innovative/ customised products with better quality with shorter lead times and all at a reasonable price.

For businesses, and manufacturing companies in particular, this means more fragmented markets with wider variety of products at reduced costs and shorter lifecycles in an increasingly competitive environment. This is a far cry from their history of pushing products into a marketplace where a customer was expected to be loyal to a brand and grateful for the privilege of buying. In response to this and the pressure to create shareholder value, manufacturing organisations have moved towards outsourcing or relocating their manufacturing base in lower cost countries. While this may have, potentially, expanded their businesses into new markets, it has also contributed to increasingly fragmented organisations hence the rise in Supply Chain Management (SCM). The concept of SCM deals with the management of complex factors and relationships within the business process of making a product, starting from its raw

material/ component suppliers through to the ultimate consumer, whilst leveraging available resources to deliver maximum value to stakeholders. Thus they have moved into an era where ‘*supply chains compete, not companies*’ (Christopher, 1998) and as such the planning, design and organisation of their supply chains plays a significant role in their ability to compete and survive over a long-term.

Unlike manufacturing strategy, supply chain strategy is not an inward looking concept; it requires manufacturing organisations to constantly seek inter-organisational collaboration, based on mutual trust and commitment, across the supply pipeline of a product to create offerings to customers beyond their internal capabilities. So manufacturers are pressured by customers to develop the ability to operate as an efficient member of an extended and increasingly global supply network (Gindy, 1999). Manufacturers therefore, as key players within the supply chain, need to adopt strategies that will align themselves with the needs of their customers, suppliers and shareholders. This may involve constant change in competitive priorities of which research has shown that they are slow to adopt (De Meyer et al., 1989). A typical approach within manufacturing organisations is to employ the latest fad such as Lean Manufacturing, Agile Manufacturing, Customer Focus or Business Process Reengineering (BPR). However manufacturers have come to realise that even when cost savings and other improvements have been made through employing such paradigms, these have not necessarily translated into competitiveness (De Meyer, 1990) leaving organisations with the problem of ‘what to do’. As a result this thesis proposes the possibility that organisations of today can take a market sensitive approach to ensure that the strategies they develop and implement within their manufacturing systems are suitable to their market needs and will also optimise the value they appropriate for their shareholders as opposed to following trends in paradigm shifts. This approach has been termed ‘market responsiveness’ and as a starting point the research question is “*How should organisations decide on what strategic concept to adopt in their supply chain environment in order to respond to market change and/ or position the firm in the market for long-term competitiveness?*”

1.1.1. Delimitation of the Study

Delimitations are necessary to make actions and analyses possible. The following delimitations are based on how the researcher, research participants perceive relevant interdependencies.

The research will look into the following:

- The demand-supply chain in terms of demand creation and order fulfilment of a physical product thus lending itself to the manufacturing sector.
- The scope has been narrowed specifically to for-profit organisations based in the UK/ Europe.
- Populations are limited to key strategic decision makers, planners and executors such as senior management, middle management and directors.
- Supply chain that consists of a manufacturer its supplier, customer and if necessary third parties.
- Demand creation being mainly in the marketing arena is limited to segmentation and differentiation.
- Most recent paradigms in manufacturing such as leanness and agility are debated and considered to be strategic responses of manufacturers. The debate is not about which of these will supersede the other but more about which is the most appropriate response to a specified context.
- Developing a performance management system as a means to manage strategic response but not to prescribe metrics.
- The supply chain in respect of a physical product.

What the research will not cover:

Although this research has used theories of competitive strategy and paradigm shifts in operational concepts such as Lean & Agile, no attempt will be made to measure leanness or agility. The background theories behind these concepts are used in developing a theoretical framework and are of an explanatory nature. These theories have provided a starting point argument that the strategic activities of a firm/ supply chain have potential implications for internal resource organisation and external supply chain structure. Therefore any review on them is solely for the purposes of aiding understanding.

Structure of the Thesis is on **Figure 1-1**.

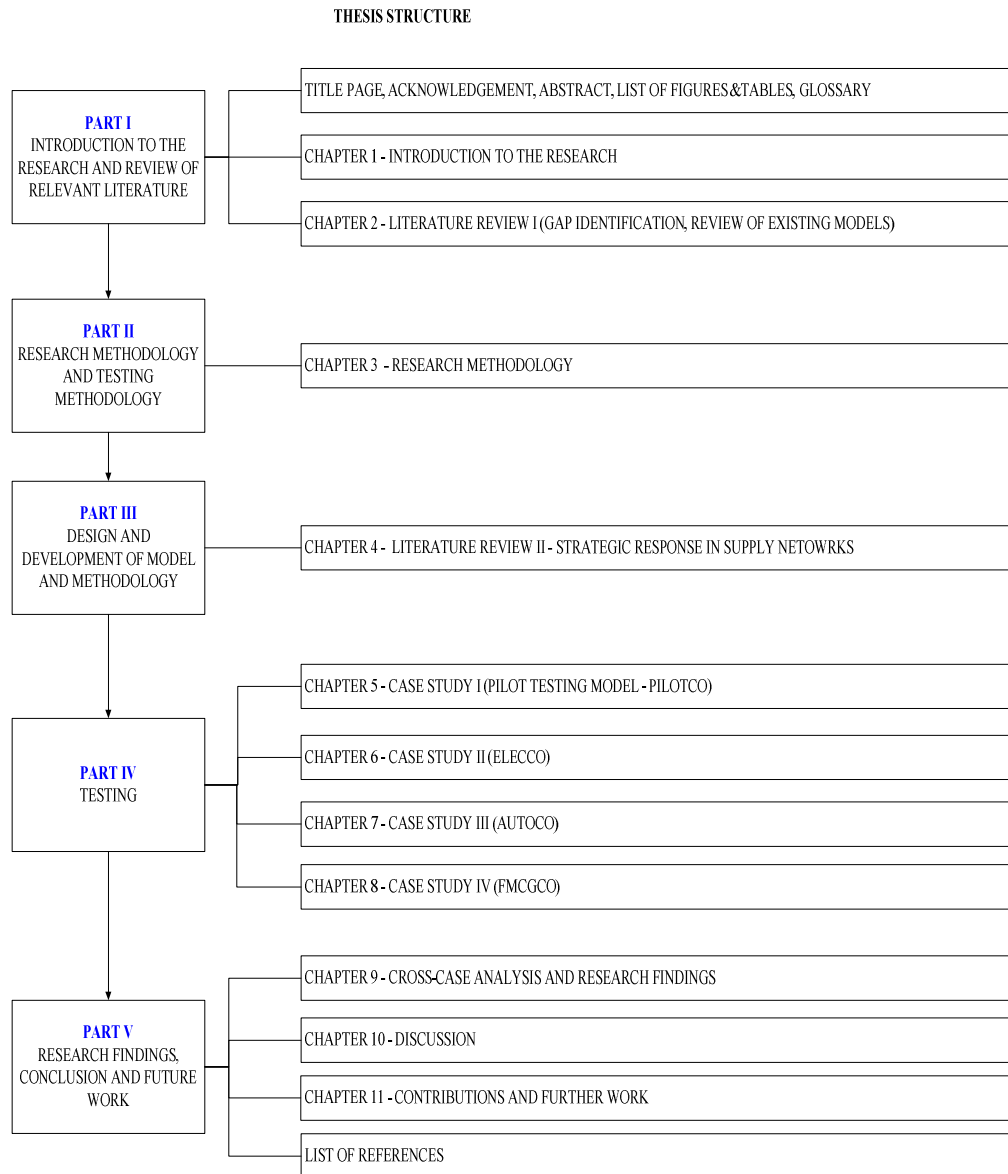


Figure 1-1: Thesis Structure

CHAPTER 2.**Literature Review I - Gap Identification**

The purpose of *Chapter Two Literature Review I* is to:

- Define the research problem as a result of the literature reviewed from the previous chapter.
- Identify gaps in the literature where a contribution may be made.
- Identify the research question.
- Define the aim and objectives of the research as a result of the above.
- Review the implications of this research proposal with a view to deriving the aims and objectives of the research from which a suitable methodology can be designed.

Introduction to Manufacturing systems

A manufacturing system is a system, consisting of extensive interactions between people, information and machines (Baines and Kay, 2001), designed to convert raw materials into marketable finished goods Wu (1994) so as to meet the demands of the market in terms of quantity, quality, cost and time and also meet the financial and other objectives of the company (Bonney, 1997). An adaptation of Wu's systematic view of a manufacturing system is illustrated on **Figure 2-1**.

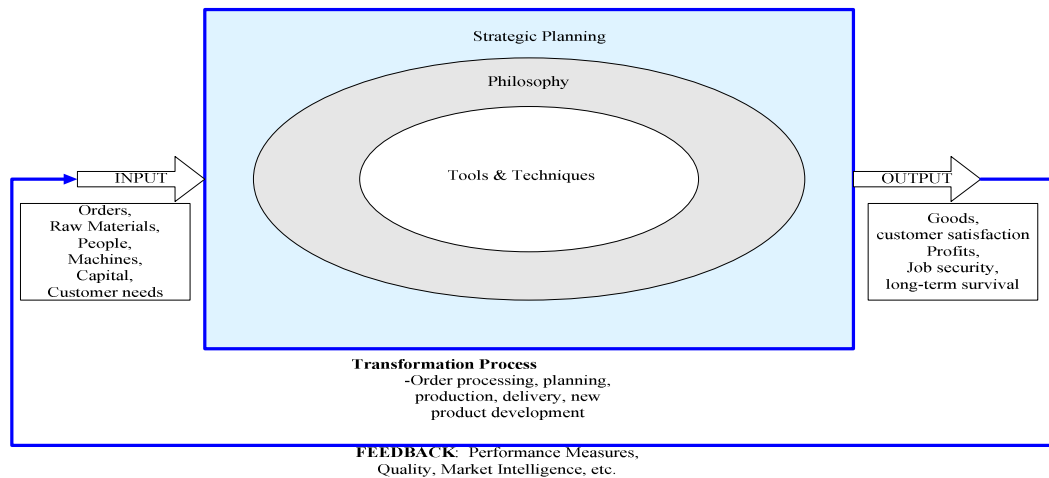


Figure 2-1: A systematic view of a manufacturing system

In order for manufacturing organisations to operate profitably emphasis is placed on reducing cost, minimising time and fitness for purpose. Over the years advances in manufacturing management principles and approaches have evolved as described in **Figure 2-2**.

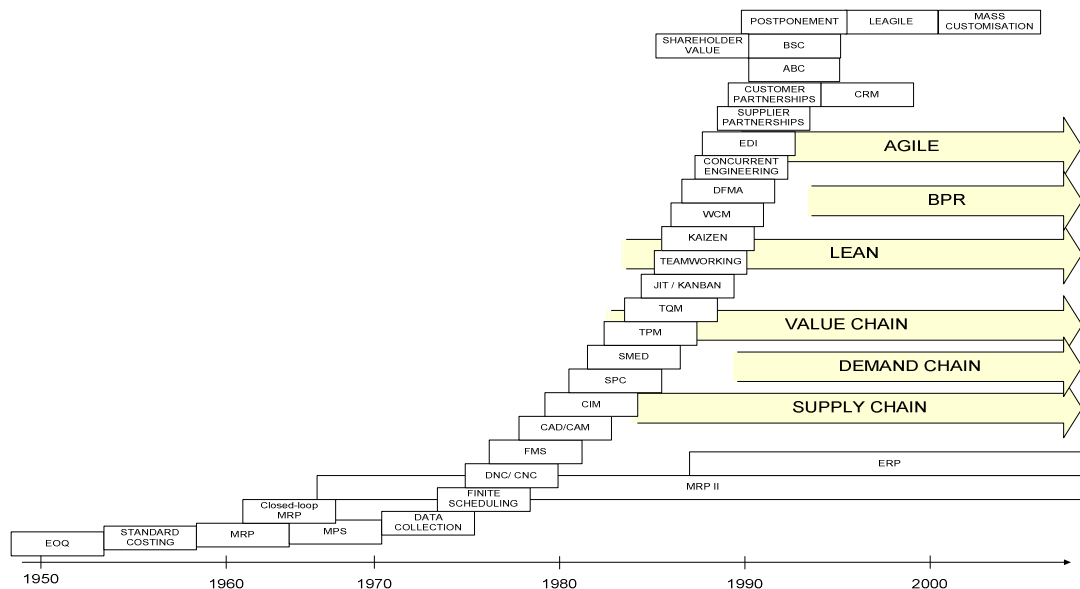


Figure 2-2: Manufacturing history

In recent times it is believed that manufacturing management is being superseded by supply chain management particularly in developed economies. This is because a lot of

organisations in developed economies have been outsourcing goods and processes from cheaper countries. This type of outsourcing has contributed to fragmentation in organisations thus making supply chain management even more important for organisations today.

2.1. Introduction to Supply Chain Management

New (1994) suggests that the origin of the 'supply chain' can be dated back from the emergence of systems theory in the 1950s by Boulding and Cavinato. Boulding had observed that the behaviour of a complex system cannot be understood by the segregated analysis of its constituent parts whilst Cavinato (1992) contributed the notion of holism. New (1997) also argues that three meanings dominate the supply chain metaphor and these are:

1. The supply chain from the perspective of an individual firm;
2. A supply chain related to a particular product or item;
3. "Supply chain" - a handy synonym for purchasing, distribution and materials management as dictated by his previous work in 1994.

New only associates purchasing, distribution and materials management as supply chain in his third meaning. Hence, it comes as no surprise that, even in recent times, some authors/researchers both in industry and academia automatically equate supply chain and supply chain management as either logistics (Frazelle, 2002; McLaren et al., 2002; Ballou, 1999 and New, 1994) or simply purchasing. It is believed that supply chain management does share some of its origins in the field of logistics however there is more to a supply chain management process than its logistics attributes. This is described by some cited definitions below.

1. The Council of Logistics Management (CLM) defines Logistics Management as *that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements. (source: [http:// www.clm1.org](http://www.clm1.org))*
2. The supply chain is the connected series of activities which is concerned with the forward flow of materials and the backward flow of information from *raw material suppliers to consumers* (Stevens, 1989).

3. Supply chain management is the management of materials and information both in and between facilities, such as vendors, *manufacturing* and assembly plants and distribution centres (Thomas and Griffin P.M., 1996).
4. The supply chain is *the network of organisations* that are involved through the *upstream and downstream linkages*, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer (Christopher, 1998).
5. A supply chain consists of *all* stages involved, directly or indirectly, in fulfilling a customer request. It is dynamic and involves the constant flow of information, product & funds between different stages (Chopra and Meindl, 2001).

The implications of these definitions are that supply chain management includes all of logistics management activities as well as manufacturing operations, and that it drives coordination of processes and activities with and across marketing, sales, product design, finance, and information technology (CLM). Therefore the scope of the supply chain includes demand planning, supplier management, purchasing, materials management, manufacturing management, facilities planning, distribution, information technology, customer service and any other activity required to provide a product or service to an end user (Chopra and Meindl, 2001; Stevens, 1989; Christopher, 1998; CLM). For this reason, its design and operation is of importance to every organisation involved in the network. **Figure 2-3** is a description of the typical components of a supply chain. It is a simplistic description of a supply chain as in reality the supply chain of a particular product can consist of multiple suppliers, customers and other third parties. Hence, certain authors e.g. (Christopher, 2005) have argued that the term, supply chain, is inappropriate for describing this reality and supply networks would be more fitting.

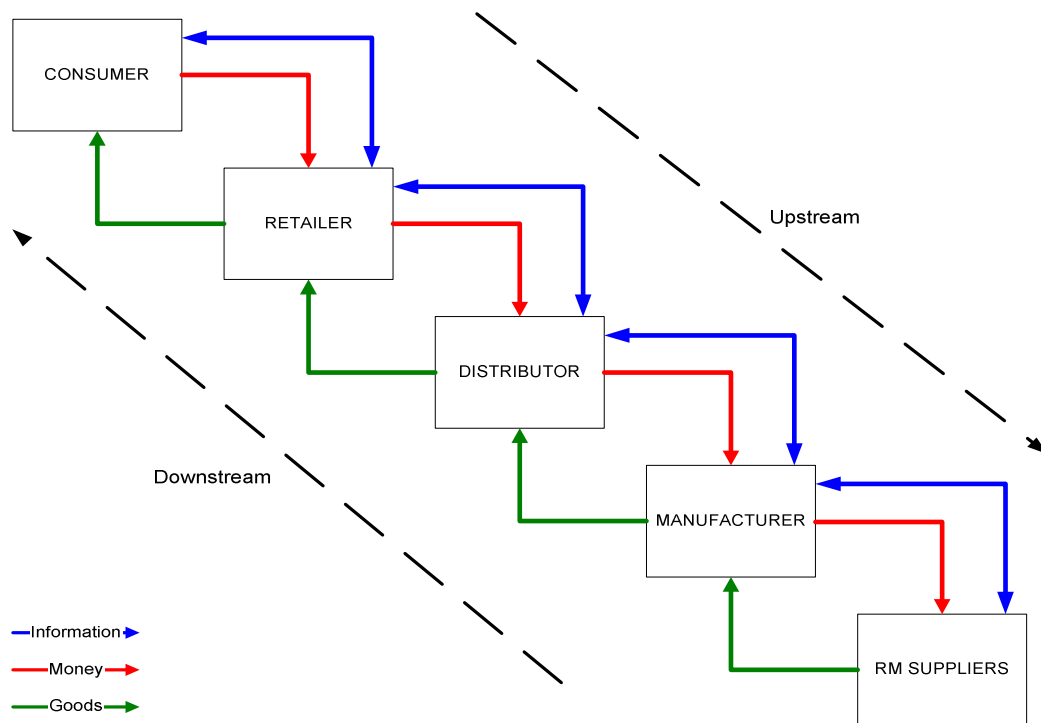


Figure 2-3: A typical supply chain

Of late, other authors have argued that this ought to be described as “demand chain management” or “demand chain networks” as this shifts the focus from ‘push’ to ‘pull’. Whilst some have advanced further to a new term “value chain” or “value networks”. The value concept is not particularly new as Porter (1980) originally describes a value chain. However its scope and meaning is unfolding with the influx of new research as elaborated in Chapter Six. Nevertheless the objective of managing such networks is to synchronise the requirements of the customer with the flow of material from the suppliers in order to effect the balance between what are often seen as the conflicting goals of high customer service, low inventory investment, low unit cost (Stevens, 1989), good quality and profitability. For the rest of the thesis, the term supply chain is used to describe such networks of entities and processes that are concerned with synchronising demand information with supply of material to meet the requirements of the ultimate consumers. A supply chain could therefore be intra-organisational (i.e. concerned with the internal processes required to supply a product/ service to customers with the players being internal departments.) or inter-organisational (i.e. concerned with the

supply of products/ service to customers with the players being separate business entities as described on **Figure 2-3**).

2.2. Manufacturing Systems and Supply Chain Management

Since it has been determined, from the previous section, that a manufacturing organisation is a key part of the supply chain, it can also be inferred that manufacturing systems will need to be designed according to the needs arising from its supply chain environment for long-term survival. Both share, essentially, the same goals of providing customers with finished products that are of good quality with good service while maintaining profitability. A manufacturing organisation within a supply chain is essentially serving the end user be it directly or indirectly. However, the reality of being a manufacturer within a supply chain or a supply chain achieving its goal of customer satisfaction can involve conflicting decisions. Also, since there are a number of organisations operating within a supply chain environment some of the following issues have become prominent on a research agenda within supply chain and manufacturing systems improvement arenas. These issues include:

Bullwhip effect – this refers to the phenomenon where orders placed to the supplier tend to have larger variance than sales to the buyer (i.e. demand distortion) and the distortion propagates upstream in an amplified form (i.e. variance amplification) (Lee et al., 1997). To mitigate this effect, research in *collaborative forecasting* due to uncertainty in demand and *visibility of orders* is eminent in the field of supply chain management.

Performance measures – there is gap in this area as there is no set way of measuring performance in a supply chain. Also the fact that a manufacturer has achieved 80% percent efficiency does not necessarily mean that it has achieved customer satisfaction.

Conflicting goals between customers and suppliers – this is an intra-organisational problem that not only affects the organisation but the supply chain as a whole. If on the upstream an organisation is focussed on differentiating as an innovator but the organisation downstream is differentiating as cost competitive, the organisation downstream is unlikely to get as much variety as it would like to serve its customers. This leads to another issue in terms of *clarity of vision* as each organisation within a supply chain operates within its own markets and may not necessarily understand their

customer's market. Also as organisations tend to be concerned about maximising their returns there is an issue of *trust* amongst organisations when it comes to sharing information that will enable them to meet their individual goals.

Cultural differences – the concept of supply chain management is about taking a holistic approach to serving an ultimate customer need with a belief that taking a holistic approach will maximise the use of resources as well as maximise profitability for all parties involved. This implicates differences in organisation culture as issues.

Power issues - although there is little research, there are arguments to show that the concept of power is highly relevant in supply chain management as each entity in the chain is seeking to appropriate value for themselves (Cox, 1999). Such pursuits often lead to conflicts of interest that have an impact on how supply chains can be managed thus meaning powers structures have to be understood.

In attempts to manage the issues indicated above organisations and supply chains have resorted to using concepts, methodologies and tools; some of which have had their origins within the manufacturing environment but have been replicated in other fields including supply chain to manage performance. The most prevalent of these paradigms are Leagility, Agility, Leanness and Business Process Reengineering (BPR). In order to understanding the challenges of current management practice it has been necessary to review literature within the aforementioned subject areas, in terms of the philosophies behind the concepts, their tools and performance measures. The next section discusses these paradigms individually and assesses the loop holes within them that this research aims to satisfy.

2.2.1. Business Process Reengineering (BPR)

Business Process Reengineering is “the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures such as cost, quality, service and speed to maximise the benefits of information technology” Hammer & Champy (1995). Key words in its definition are summarised in **Table 2-1**. Four characteristics of Reengineering as indicated in by Hammer & Champy (1995) include:

Process-Oriented - Reengineering is achieved by reviewing the entire process rather than narrowly defined tasks.

Ambition - Businesses focusing on major improvements rather than minor improvements.

Rule-Breaking - Any previous assumptions about how the process ought to be are abandoned.

Creative use of information technology - Information technology is viewed as an enabler that allows organisations to do work in radically different ways. This includes the use of shared databases(simultaneous information sharing), expert systems (less skilled staff – generalist doing the work of an expert), telecommunication networks (businesses can simultaneously reap the benefits of centralisation and decentralisation), decision support tools (decision-making is part of everyone's job), wireless data communication and portable computers (field personnel can send and receive information), interactive video disk (effective contact with potential buyer), Automatic identification and tracking technology (tracking items), High performance computing (plans get revised instantaneously).

<i>Fundamental</i>	- <i>'it implies no assumptions. BPR determines what a company must do, then how to do it.'</i>
<i>Radical</i>	- <i>'disregarding all existing structures and procedures and inventing completely new ways of doing work.'</i>
<i>Dramatic</i>	- <i>'not making marginal or incremental improvements but achieving quantum leaps in performance.'</i>
<i>Processes</i>	- <i>'A business process is a collection of activities that takes one or more kinds of input to and creates an output that is of value to the customer.'</i>

Table 2-1: BPR: Key words

Performance Measures

Performance is measured by value created but no list of measures is implied except the advice that compensation should be set according to the value created.

Conclusions on BPR

Reengineering should be brought in only when a need exists for radical change. Therefore it is not a continuous process but a tool that has occasional usage.

Its proponents have described three kinds of companies that undertake BPR and these are:

1. Companies that have no choice. Their costs are much higher than their competitors.
2. Companies that foresee trouble – new competitors, changing customer requirements or characteristics, an altered regulatory or economic environment.
3. Companies that have no discernable difficulties but have ambitious aggressive management and want to lead further in their markets.

BPR in terms of supply chain management requires organisations to take a process-oriented approach. Its radical approach may increase reluctance amongst organisations in the supply chain.

2.2.2. Lean Thinking

Leanness means developing a value stream to eliminate all waste including time, and to ensure a level schedule (Naylor et al., 1999). The concepts of lean as identified by its proponents, Womack & Jones (1996) are:

Value - Specify value as defined by the ultimate customer and express in terms of a specific product/ service, which meets the customer's needs at specific price at a specific time.

Value stream - Identify the value stream, which is the set of all the specific actions required to bring a specific product/service through problem solving, information management and physical transformation to the customer.

Flow - Arrange tasks along the supply chain so that they flow smoothly from one step to next eliminating wasteful activities.

Pull - Create a pull system where actual customer demand pulls the products through the supply chain. It is believed that the demand of the customer becomes more stable as a result and in turn the supply chain becomes more stable too.

Perfection - Getting value to flow faster exposes waste and thus allows the removal of variability in workload by the smoothing of orders across the supply chain. Customer value becomes more accurate as dedicated product teams are in direct dialogue with the customer and there is transparency in the supply chain. Thus by establishing the best way of working and ensuring that it is consistently followed across the business further

provides a basis for continuous improvement. However, (De Meyer, 1992) reported that many manufacturers implementing customer-driven lean techniques had discovered that the concrete results on the shop floor had not been translated into increased competitiveness of the companies. The firms taking part in the survey indicated an increased dependence on their supply pipelines as relationships and dependencies were being formed externally. So, although the lean paradigm supports partnership with suppliers, complexity and dynamism have been neglected due to *smoothing*. This is probably because its proponents, Womack et al. (1990), had applied their techniques in established industries that have relatively stable demands.

Performance measures

No performance measures are mentioned by Womack et al (1990) but cost and time savings are implied. For this reason and for its popularity a lot of work has been put in by authors such as (Villegas-Moran, 2003; Toni and Tonchia, 1996) to work out how to calculate leanness.

Conclusions on Lean Approach

Manufacturers will need the ability to cope with multiple-differentiation through rapidly changing value chain configurations. Also although the lean paradigm set out a logical approach to achieving leanness there are no measures for leanness. It is a repetitive process for continuous improvement. How is leanness controlled? Leanness lacks innovation management and is not suited to all industries especially those that have relatively stable demands.

2.2.3. Agility

Agility is a new trend that has evolved perhaps from the disenchanting aspects (or shortfalls) of leanness described in the previous section. The following are some definitions of agility:

‘agile manufacturing is the reorganisation of production adapted to distinctively new market forces that have undermined the mass production organization that dominated the 20th century.’ Nagel and Dove, 1993 (Kidd, 2000)

‘... agility is characterized by cooperativeness, by the rapid production of high quality, customized goods, by a knowledgeable and empowered workforce, and by an

information infrastructure that links computers, marketers, engineers, and robotics in a unified electronic web.' Nagel and Dove, 1993 (Kidd, 2000)

'...the integration of organisation, highly skilled and knowledgeable people, and advanced technologies, to achieve co-operation and innovation in response to the need to supply customers with high quality customised products' (Kidd, 1994)

"Agility is dynamic, context specific, aggressively change embracing, and growth oriented. It is not about improving efficiency, cutting costs, or battening down the business hatches to ride out fearsome competitive storms. It is about succeeding and about winning profits, market share and customers in the very centre of competitive storms that many companies now fear." Goldman, Nagel and Preiss, 1995 (Kidd, 2000)

'...it is the ability to innovate and respond quickly and thereby adapt to change, while ensuring that cost and quality do not suffer.' (Booth, 1996)

'The ability of an enterprise to manage the changing unpredictable world of commerce and industry and survive in markets that demand rapid response to unexpected changes in consumer demands, competitive challenges and technological breakthroughs' (Owen and Kruse, 1997)

Agility as defined by Naylor (1999) is using market knowledge and virtual corporation to exploit profitable opportunities in a volatile market place.

It is interesting to see how the definition of agility has evolved over the years. Agility has taken over from lean in terms of satisfying the unpredictable demands of customers for highly customised products and speed. Conceivably there are no methods behind it. Agility is a paradigm (supposedly) that is still not fully grasped as it has been confused with leanness, flexibility and responsiveness (Ross and Francis, 2003).

Tracing the roots of agility to its founders at the Iacocca Institute, their report Nagel et al. (1991), state nine elements of Agile Manufacturing as follows:

1. Business metrics and procedures that is supportive of agile manufacturing development.
2. A communications & information infrastructure which enables individuals and teams to rapidly interact, across large geographical distances and between and within enterprises
3. Teaming mechanisms that support and allow co-operation.

4. Flexibility within the enterprise to allow for rapid response in an environment that is undergoing continuous change.
5. Human elements that are supportive of human needs, human resource utilisation & so forth.
6. Elements that support subcontractors & suppliers & will also enable many small to medium size companies with limited financial resources to integrate into computer networks of large manufacturing companies.
7. Concurrency across scope of enterprise to encompass all aspects of the manufacturing organisation not just new product introduction and product development.
8. Technology deployment elements that will improve and accelerate the exploitation of new technologies.
9. Environmental enhancement to meet increasing customer expectations and legal requirements for conservation of resources & protection of the environment.

The institute further highlighted 27 subsystems as the enablers of the nine elements:

1. Continuous education and training.
2. Customer interactive systems.
3. Distributed databases.
4. Empowered individuals and teams.
5. Knowledge-based artificial intelligence systems.
6. Modular re-configurable process hardware.
7. Organisational practices.
8. Energy conservation.
9. Enterprise integration.
10. Performance metrics and benchmarks.
11. Pre-qualified partnering.
12. Rapid co-operation mechanism.
13. Evolving standards
14. Global dynamic multi-venturing.
15. Global broadband networks.
16. Representation methods.
17. Simulation and modelling.

18. Software prototyping and productivity.
19. Streamlined legal systems.
20. Groupware.
21. Human-technology interface.
22. Integration methodology.
23. Supporting accounting metrics.
24. Technology adaptation and transfer.
25. Waste management and elimination.
26. Intelligent control.
27. Intelligent software.

Kidd (2000) identified the following key words and phrases that define the agile paradigm:

Fast - Agility is having a very high speed of response to for example, new market opportunities.

Adaptable - Agility is having the capability to change direction with ease, for example, to enter completely new markets or product areas.

Robust - Agility is having the capability to withstand variations and disturbances, for example, products that lose market appeal owing to changes in customer preferences.

Virtual corporations - Agility is the combination of talents between companies through (short term) joint ventures.

Reconfiguration - Agility is the ability to very quickly reconfigure corporate structures, facilities, people, organisation, and technology to meet (often) unexpected and (probably) short lived market opportunities.

Dynamic teaming - Agility requires actively looking for and building off the creative and innovative talents of other team members.

Transformation of knowledge - Agility requires the explicit transformation of raw ideas into a range of capabilities which are then embodied in both products and services. The Iacocca Institute's work appears to be the earliest publication on agility. This in combination with Kidd (1994) leads to conclusion that agility is subjective. This view is supported by Shaw et al. (2003). They however believe that agility is responsiveness with initiative whilst flexibility falls as a capability of that. Their view is supported by Nelson and Harvey (1995 - cited by Kidd, 2000) who state that "Agility is a capability;

it is an organization's capacity to respond rapidly and effectively to unanticipated opportunities and to proactively develop solutions for potential needs."

So what is agility?

A **concept** is a thing of thought, a general notion; an idea, invention. (Chambers, 1994) therefore agility is not a concept.

A **philosophy** is knowledge of the causes and law of all things; the principles underlying any sphere of knowledge; reasoning (Chambers, 1994) therefore agility is not a philosophy.

A **panacea** is a cure for all things (Chambers, 1994) therefore agility is not a panacea.

A **technique** is a skilled procedure or method; a knack or trick of doing something.

Chambers' (1994)'s definition means that agility is not a technique.

A **methodology** is a system of methods and rules applicable to research or work in a given science or art; an evaluation of subjects taught, and the principles and techniques of teaching them (Chambers, 1994). Agility is not a methodology.

A **paradigm** is an example; a basic theory, a conceptual framework within which scientific theories are constructed. (Chambers, 1994) therefore agility is can be represented as a paradigm.

A **principle** is source, root, origin; a theoretical basis or assumption from which to argue; a fundamental truth on which others are founded or from which they spring; a law or doctrine from which others are derived. (Chambers, 1994)

A **strategy** is any long-term plan (Chambers, 1994) for gaining an advantage.

A **tenet** is any opinion, principle or doctrine which a person holds or maintains as true. (Chambers, 1994)

A **strategic position**: a position that gives its holder a decisive advantage (Chambers, 1994). Agility can be, decidedly, a strategic position because it is an aspiration (a set list of things an organisation wants to be) and it is an ability (an organisation may either be able to fulfil the complete list or not and can be able to do it in one of many different ways). This is because there is not a set way of achieving the goal of agility.

Performance Measures

No performance measures have been identified by its proponent but authors such as Villegas-Moran (2003) and Tsourveloudis (1999) are working in this field.

Conclusions on Agility

Therefore, in terms of supply chain management agility implies sensitivity to the market and thus encourages enterprise/cross-enterprise integration. It does, however, imply higher costs than Leanness and it is debateable that it is more responsive as it could depend on the market/industry.

Most of the literature reviewed tells of what it is not, what an organisation has done, needs to do in order to become agile but there is no one definition or a concept of agility. It appears to embrace whatever methodology is adapted to achieve the above objectives thus leading to the conclusion that:

- It is a subjective auditing tool (Shaw et al., 2003).
- It is an aspiration
- It is list of capabilities.
- It is a strategic position.
- It is not a concept.
- It is and ability to respond rapidly but not responsiveness in itself.

2.2.4. Leagility

Leagility as defined by Naylor (1999) is the careful combination of both lean and agile paradigms. This relatively new idea that leanness and agility are complementary is increasingly being promoted by authors (e.g. Villegas-Moran, 2003; Castiaux, 2003; Prince and Kay, 2003; Waddington, 2003; Christiansen, 2003; Ross and Francis, 2003). Naylor et al.'s was the earliest work on this idea. Their paper, after highlighting the difference between lean and agile paradigms, suggests that both strategies can be applied to the same supply chain around a decoupling point. They defined the decoupling point as the point that separates the part of the supply chain that responds directly to the customer from the part of the supply chain that uses forward planning and a strategic stock to buffer against the variability in the demand of the supply chain. By optimally positioning the decoupling point along the chain the lean paradigm can be

applied upstream of the decoupling point as the demand is smooth whilst the agile paradigm is applied downstream from the decoupling point where the demand is variable.

The idea that lean and agile strategies can be complementary means that increased efficiency can be realised with lesser costs than that implied if using agility on its own.

Can lean and agile be truly complementary?

Major issues around this idea are:

1. Pushing the decoupling point downstream could create a conflict in terms of pushing costs (stocks) further downstream for another organisation to absorb.
2. It can be argued that, from a strategic context, leanness and agility have contrasting focuses. Whilst leanness focuses on waste reduction thus resulting in the reduction of operational costs. Agility is more to do with being highly customised, bringing in a variety and doing so rapidly. Pushing the decoupling point further downstream in the supply chain may mean that people further down the hierarchy are making strategic decisions in terms of prioritising customisation against cost. This is something that should have already been dictated by the business strategy in terms of an organisation's market differentiator.
3. The two arguments above are dependent on how frequent a decoupling point moves. Nevertheless with this being a relatively new idea, there is room for research.

2.2.5. Overview of Operating Paradigms in Supply Chain Management

The two most researched and debated paradigms within the field of supply chain management are Leanness and Agility. Leanness is typically seen in terms of value chain optimisation and improved value propositions, whilst Agility is typically seen in terms of being sensitive to the market needs and therefore coping with fluctuating demands. Their difference is the emphasis that is placed on their attributes. Where the focus of leanness is on adding value by eliminating waste thus cost saving and further meaning that the company could become price competitive, agility hints at highly

customised leading edge products and services. Taking either approach also assumes two different types of customer. Although these paradigms are inferred and can be embraced into different organisational strategies, there is no means of proving that one strategy works better than the other or that the strategy adopted is well managed and controlled as there are debates around what the paradigms are. This is probably why some researchers have focused on measuring Leanness and Agility.

However an issue with these paradigms and the attempts of researchers to measure them is that whilst initially they radicalise status quo thinking by helping management identify and focus on issues limiting their competitiveness, over a period of time their users become experts on focusing on such issues however changes may have occurred in the market environment that requires the business to shift its focus. Often such businesses may not have recognised the change or the need to change or even if they did they do not know how to make such a change as they have become programmed to a way of working. Another contributing factor is that these paradigms are often employed with little alignment with their market differentiators. Therefore measuring how good an organisation or a supply chain is at reducing cost or being operationally efficient (leanness) does not make them competitive in the market place nor translate into customer satisfaction or increased market share. To add to this, organisations tend to follow these principles as the latest way to become competitive rather than consider what their market need and what approach needs to be taken to satisfy these needs. This hints that there could be merit in researching the possibility of having a generic model that can help organisations determine what approach is best suited to them on the basis of their market requirements.

Notwithstanding, the three key goals of any for-profit organisation and any for-profit supply chain are:

- Profitability – this is the reason why such an organisation is in business in the first place to create ‘value’ for itself and its owners (or shareholders).
- Customer satisfaction – in this case, the ability to meet the needs of the customer being served in terms of fit-for-purpose, pricing, quality, service, support etc. However even in such a case such an organisation is typically only interested in doing so as a means to appropriate more ‘value’ to itself.

- Other stakeholder satisfaction - This includes competitive moves (Porter, 1980)
 - having awareness of the market and competitors, their strengths, positioning with the organisation being able to use this to strengthen its position in the market.

Therefore, long-term competitiveness for a for-profit organisation is the ability to sustain shareholder value and customer value by orchestrating better response than its competitors. Other stakeholder satisfaction, such as suppliers, employees, government and pressure groups, is assumed for the rest of this study to only form a major part of the objective of a for-profit organisation as far as it impedes shareholder value / customer value and their response capabilities.

So to achieve these goals an organisation /supply chain needs to be aware of their customer's requirements, be aware of what their competitors can provide and be able to design and manage its operations in a cost-effective manner to suit whilst remaining within its remit. This calls for a market-driven approach that can ensure that all these requirements are pulled together to create a competitive system that utilises an operational concept that is most suitable to its strategic objectives. It further emphasises a requirement for a generic model that satisfies a market-driven approach that, in turn, enables practitioners to take decisions on how competitive they need to be in the market place and which concept is the best to adopt regardless of its 'label'. Such an approach should be the focus of employees of an organisation/ supply chain whilst the operational concepts are tools that provide the means to achieving desired goals. Therefore the market-driven approach is primary and would sit under *Strategic Planning* on **Figure 2-1** whereas the operational concepts and tools used to achieve the desired goals are secondary and would sit under *Philosophy, Tools & Techniques* on **Figure 2-1**. Such a model would be looking at how well the transformation process is performed with respect to the feedback information that goes back into the system.

2.3. Taking a Market-Driven Approach

It has been established from previous sections that an organisation and a supply chain exist to serve three key goals (shareholder value maximisation, customer value maximisation and other stakeholder satisfaction that impede shareholder value / customer value) that equate to long-term competitiveness. It has also been established

that an organisation and a supply chain need to take a market-driven approach for long-term competitiveness. If the above is true then any organisation or supply chain needs to be responsive to its market and market responsiveness should be the key aspiration for any organisation and supply chain.

Porter (1980) identified three generic strategies (cost leadership, differentiation and focus) that can be implemented at the business unit level to create competitive advantage and defend against the adverse effects of the five forces.

The model proposed by Treacy & Wiersema (1993) of three value disciplines dictates that an organisation needs to focus its customer value in line with one of three value disciplines that include:

1. *Operational excellence* - providing customers with reliable products or services at competitive prices and delivered with minimal difficulty or inconvenience.
2. *Customer intimacy* - segmenting and targeting markets precisely and then tailoring offerings to match exactly the demands of those niches. This combines detailed customer knowledge with operational flexibility so that the organisation can respond quickly to almost any need from customising a product to fulfilling special requests.
3. *Product leadership* - offering customers leading-edge products and services that consistently enhance the customer's use or application of the product, thereby making rivals' goods obsolete.

The output of Treacy's (1993) research is partly supported by Hagel and Singer's (1999) view of three businesses within an organisation. Their work suggests that an organisation consists of three kinds of businesses that are intertwined but very different.

The suggested businesses are:

1. A *customer relationship business* that identify, attract and build relationship with customers.
2. A *product innovator business* that conceives of attractive new products and services and commercialises them.
3. An *infrastructure business* that builds and manages facilities for high volume repetitive operational tasks.

Each of these businesses employs different types of people and has different economic, competitive and even cultural imperatives and it is for this reason that there are

conflicting goals amongst corporate departments. They suggest that, going forward, organisations will have to *un-bundle* (i.e. separate the three entities) and *re-bundle* (come together again) as one of the three businesses thus meaning that organisations of the near future will become specialist businesses.

The work of Hagel & Singer (1999) on *un-bundling* and *re-bundling* of organisations highlights the possible source of conflict within supply chains. Within an organisational context, a manufacturing function tends to focus on operational effectiveness and consistently seeks to drive costs down, a customer service function places emphasis on giving customers whatever they want whereas a product development function tends to focus on being creative than on the costs/ complexity to operations.

So for the entire supply chain to be responsive to its market, it needs to adopt a strategy that works across its entire value chain. This value may be defined by one of the three disciplines identified by Treacy & Wiersema and consequently decisions taken across the supply chain and at different employee levels will be prioritised by the choice of focus to facilitate harmony across the supply chain whilst ensuring its goals are being met. From these models of competitive strategy, the effects of paradigms such as leanness and agility on organisational focus become visible as certain attributes of these paradigms are better suited to one value discipline or another. The matrix below (**Table 2-2**) is an attempt to explain this. By aligning Treacy & Wiersema's value discipline with Hagel & Singer's perspective of conflicting organisational functions, a suitable response requirement of a function can be determined on the basis of the value focus. Such analysis via (**Table 2-2**) provides evidence that the response from each function will be different depending on the organisational focus. It also shows that each of the value disciplines prescribed by Treacy and Wiersema require different response. Furthermore it indicates how much more complex the issue is within a supply chain context as it involves more organisations that possibly have conflicting value disciplines.

Moreover it strengthens the argument, from **Section 2.2.5**, about deciding on the paradigm to adopt as a result of the identified market-driven goals. Therefore, having a generic response model that can enable for-profit organisations/ supply chains to make strategic decisions will be useful in terms of:

1. Determining how responsive they need to be in order to optimise shareholder and customer value;
2. Identifying how responsive they currently are and potential gaps in their process of delivering value;
3. Making decisions that can be tested, on the best paradigm/ approach to adopt in order to define the response capability required to appropriate optimum value to their shareholders, customers and other key stakeholders.

Such a model can be in the form of a performance management system (that also is a gap in the field of supply chain management) or a qualitative approach designed around the three key goals that are required for long-term competitiveness.

Table 2-2: Strategic response matrix

Strategic focus/ Organisational response	Customer Relationship Management	Product Innovation	Infrastructure Management
Operational Excellence	Convince market of best price for quality.	Incremental innovations	Primary focus. Cost effective concepts such as the Lean - eliminating waste from the system. Mass/ Batch production.
Product Leadership	Define market area, identify niche and raise customer awareness of potential products	Primary focus. Leading edge innovations. Short product life cycles as maximum profitability from a new product not maximised.	Flexible approach with batch manufacturing. Ready to take up new products and product range as short product life cycles. Facilities to pilot test.
Customer Intimacy	Primary focus. Build portfolios of customers and develop close relationship with customers to understand short and long-term needs	Develop specific and individual solutions for customer	Agile concept – highly customised products. Project based manufacturing/ approach.

2.4. Problem Definition

Supply chain management is increasingly becoming a weapon for sustaining long-term competitiveness, particularly for manufacturing organisations as they are increasingly becoming fragmented due to changes in the global business environment.

A majority of materials reviewed on supply chain management revealed that most research is either focused on satisfying the customer in terms of managing demand or focused on supplier relationship. They are also largely theoretical and the ones based on empirical research are focused on a single relationship that is mostly focal company to a supplier. The scope of a supply chain is wider than that and so needs to be broadened at least as far as the customer to be able to indicate customer value. This implies gaps in supply chain management research and perhaps why it is often confused with purchasing and logistics as there is little reference to the market as a whole which involves competitors and other stakeholders. 'Responsiveness' therefore has to refer to the market as a whole as an organisation will require the ability to react appropriately to the changing needs of the market as influenced by market forces. Whilst 'responsiveness' is a widely used term, there is no definition, model or agreed consensus for it. Modelling responsiveness in the broader scope of a supply chain would require achieving strategic fit both internally and externally. However increasing fragmentation also means that there is a gap in terms of managing and controlling strategic fit to optimise value appropriated by an organisation. Thus modelling responsiveness needs to incorporate achieving strategic fit and managing performance which is also an area that has a gap in supply chain management research. This debate has led to the problem definition and **CHAPTER 4** explores strategic fit and performance measurement in supply chains in order to derive theoretical model for responsiveness.

RESEARCH PROBLEM DEFINITION

Manufacturing organisations require some kind of generic approach /measure that will enable them to decide which strategy will be best for their long-term survival. The measure should be able to help them decide where they need to be in the future and what operational concept(s) is most suitable for attaining that goal.

Research Question

How should manufacturing organisations decide on what operational concept to adopt in their supply chain environment in order to respond to market change and/ or position the firm in the market for long-term competitiveness?

Research Aim

To develop a 'responsiveness' model that makes it possible for manufacturing organisations to predict and or measure their ability to respond to the market thus aiding strategic decision-making in their supply chain environment.

Research Objectives

- 1) To define 'market responsiveness' and determine its content, enablers and inhibitors within the context of inter-organisational relationships.
- 2) To develop a model for market responsiveness for use as a strategic decision-making tool.
- 3) To determine a methodology for successful use of the market responsiveness model.
- 4) To evaluate and refine 'methodology' through practical application in industry settings.

Research Proposition

The research aims to show that having such a model can alleviate the research problem defined above. Any organisation/ supply chain that can decide how responsive it needs to be to its market should be able design its supply system around that. It is believed that by maintaining focus on such a market driven goal, an organisation/ supply chain will have a higher chance of long-term survival and sustained growth.

The market responsiveness model can be used as a quantitative/ qualitative method to effectively predict the response that is required by a dynamic supply chain system in operation or during the design process. The use of such a model will allow an organisation to determine how responsive it needs to be to its market. Furthermore, it can aid decisions on the manufacturing paradigm that is best suited to the determined 'response requirements'.

The dynamic nature of a supply chain system in operation means that the demonstrated response of the system can only be effectively evaluated by the use of a generic model as opposed to system of organisations following trends in paradigm shifts.

2.5. Chapter Summary

Increasing pressure of competition and reduction of trade barriers in the global business environment has led to increasingly fragmented manufacturing operations. For this reason it has become increasingly necessary for such operations to manage their supply chain effectively in order to react to their market in manner that keeps them competitive. In this chapter:

- The supply chain metaphor has been described relative to its influence on manufacturing systems. Its importance in manufacturing management has been established.
- Manufacturing systems has been defined and manufacturing influence on supply chain management has been identified and manufacturing organisations established as key part of a supply chain.
- It has been determined that concepts such as Leanness, Agility, BPR and Leagility are useful approaches, philosophies and tools that will help organisations and supply chains operate efficiently but are not effective on their own for sustaining long-term competitiveness. Some research work is being conducted on how to measure these approaches. The danger of this has been highlighted in terms of such measures limiting creativity.
- The importance of a market-driven approach has been identified as a requirement for long-term competitiveness.
- A responsiveness model as been suggested as a generic market-driven model that can enable organisations to test different paradigms
- It has been suggested that basing the model on generic performance measures around the three key goals required for long-term competitiveness could be a good way of assessing how different paradigms affect a supply chain's response and how well an organisation is performing.

This literature review is an historical review on the basics of business and provides a starting point for the research. It has looked at past trends and the current changes occurring in the business world and indicates the impacts of previous behaviours on modern requirements thus identifying a gap in terms of developing a response model. By conducting such a research the following outputs are expected:

- A generic response model
- A process for applying the model
- A better understanding of responsiveness

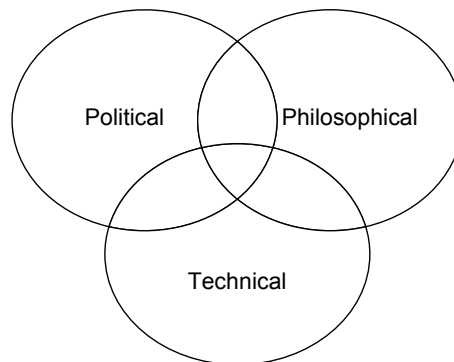
The next chapter (**CHAPTER 3**) describes the research process intended to produce the identified outputs.

CHAPTER 3.**The Research Methodology**

“The basic value, as in all science, is truth.” - (McNeill, 1990, p.10)

The purpose of *Chapter 3: The Research methodology* is to:

- Review literature on research methodology in order to identify the most suitable methodology for this research.
- Present the research design, the rationale behind the design and design constraints.
- Define the research process that will be used to address the research problem.
- Review the implications of this research process with a view to identifying the form of outputs that is sufficient to meet the research aim and objectives.

3.1. Introduction to Research Methodology

Source: Easterby-Smith et al, 1991

Figure 3-1: Three aspects of management research

Research is the gathering of information to answer a question that solves a problem in a systematic way, thereby increasing knowledge (Booth, Colomb, and Williams, 2003; Jankowicz, 1995). Three influences of management research has been described by Easterby-Smith et al. (1991) as:

Political Aspect: this aspect concerns the power relationships between the individuals and institutions involved in the research and includes the strategies adopted by different actors and the consequences of their actions on others. This aspect is considered predominantly in the research findings as a large proportion of the influence it had on the research could not be predetermined.

Technical Aspect: this aspect involves data gathering (both qualitative and quantitative) and problems of completing research work. This aspect is covered in this chapter.

Philosophical Aspect: This aspect clarifies the research design - what kind of evidence is gathered from where and how such evidence is interpreted to provide good answers to the research question. It recognises what designs will work and which will not, limitations of particular approaches to create and adapt a suitable research design. Hence this aspect addresses the relationship between data and theory and has the largest impact on the quality of the research, thus making it the primary focus of this chapter.

Saunders et al. (2000) identify some terminology that has been adapted and used to describe the research methodology process (Figure 3-2).

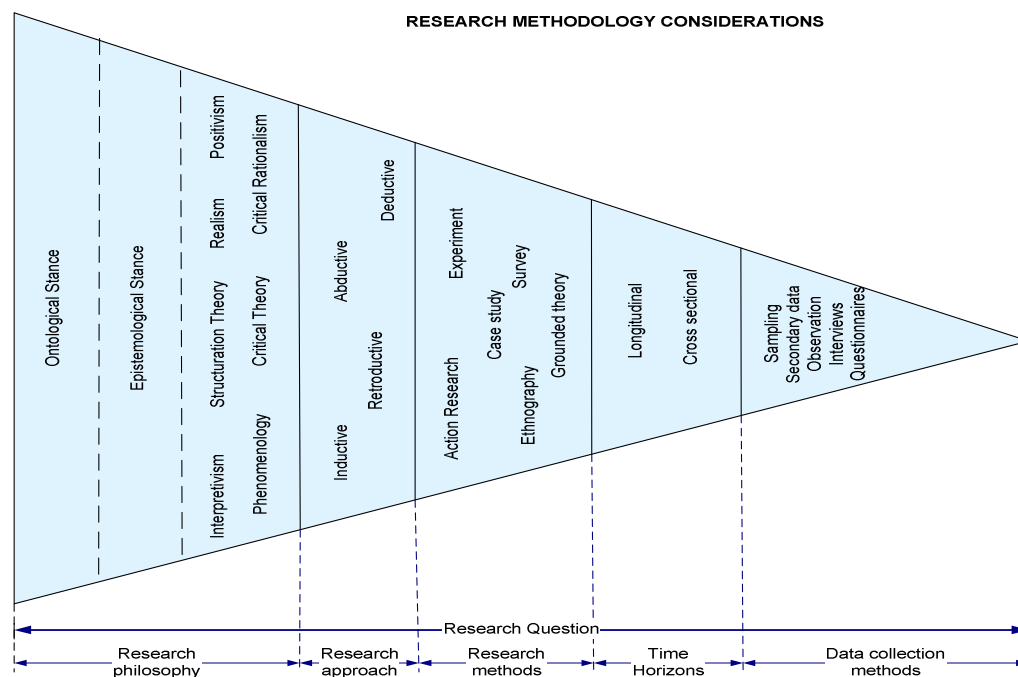


Figure 3-2: Research design considerations

3.2. Research Philosophy

The logical nature of a research design and process is affected by the philosophy adopted by the researcher, such that the research design considerations can be significantly allied to different philosophical positions (Easterby-Smith et al, 1991). It is, therefore, important to ensure that the different elements of the research design are consistent with each other. For this reason, the researcher needs to express and critically evaluate the philosophical ramifications of the research topic proposed in

CHAPTER 2.

3.2.1. Philosophical Stance from Ontology → Epistemology

The manner in which the researcher thinks about the development of knowledge affects the way the researcher goes about conducting the research. Ontology is defined as the study of the essence of phenomena and the nature of their existence (Gill and Johnson, 1991). Ontological arguments are arguments from analytic or priori premises while epistemology, defined as the study of knowledge, refers to the claims or assumptions made about the ways in which it is possible to gain knowledge of a reality, whatever it is assumed to be. Epistemology presents a view and justification for what can be regarded as knowledge, what can be known and what criteria such knowledge must satisfy in order to be called knowledge rather than beliefs (Burrell & Morgan 1979; Blaikie, 1993).

In research terms, the absence of an explicit philosophical ontology means that the object of the enquiry (i.e. the phenomenon of interest) has to be inferred from the epistemology (or methods adopted). This means that ‘knowledge’ is analysed as a direct, unmediated relation between the object of enquiry and ‘being’- meaning that our observations and our interpretations are used to determine reality and thus the ontological dimension is lost – ontic fallacy (Bhaskar, 1986). Whilst statements about ‘being’ become interpreted as statements about ‘knowledge’ – epistemic fallacy (Bhaskar, 1986). Ontic fallacy ignores the cognitive and social mechanisms by which knowledge is produced from antecedent knowledge, leaving an ontology of empirical knowledge events (raw perceptions) and a de-socialised epistemology (Bhaskar, 1986). Whereas in the epistemic fallacy, ‘being’ is understood as ‘perceived being’, something that is unperceived is a thing-in-itself at best (and neither real nor actual at worst).

These two fallacies are related in that epistemic fallacy first projects the external world onto a subjective phenomenal map, then ontic fallacy projects the phenomenal entities of that subjective map back out on the world as objective sense data, of which we have direct perceptual knowledge. So reality independent of thought is first subjectified, then the subjectified elements are objectified to explain and justify our knowledge (Irwin, 1997).

Most research is conducted in a manner that divorces ontology from epistemology. This means that 'reality' (i.e. 'being') is assumed to exist in its own right, prior to – and independent of – the actions of the social scientist observing or interpreting it. Howe (1988) cautions the use of abstract epistemological arguments that do not connect operationally with the actual research practices used to gain knowledge. It is therefore essential that the research ties its methods to the epistemological assumptions of its ontological stance because 'reality' contains beliefs about reality, which acts as objects at an ontological level and as theoretical accounts of objects at an epistemological level (Jackson, 1995).

This approach to the research philosophy was made on the basis of the following (see **Figure 3-3**): Logical requirements for linking data; theoretical framework and subsequent theory building; requirements for the interpretation of empirical data; the training and experiences of the researcher; and the researcher's personal beliefs about the world.

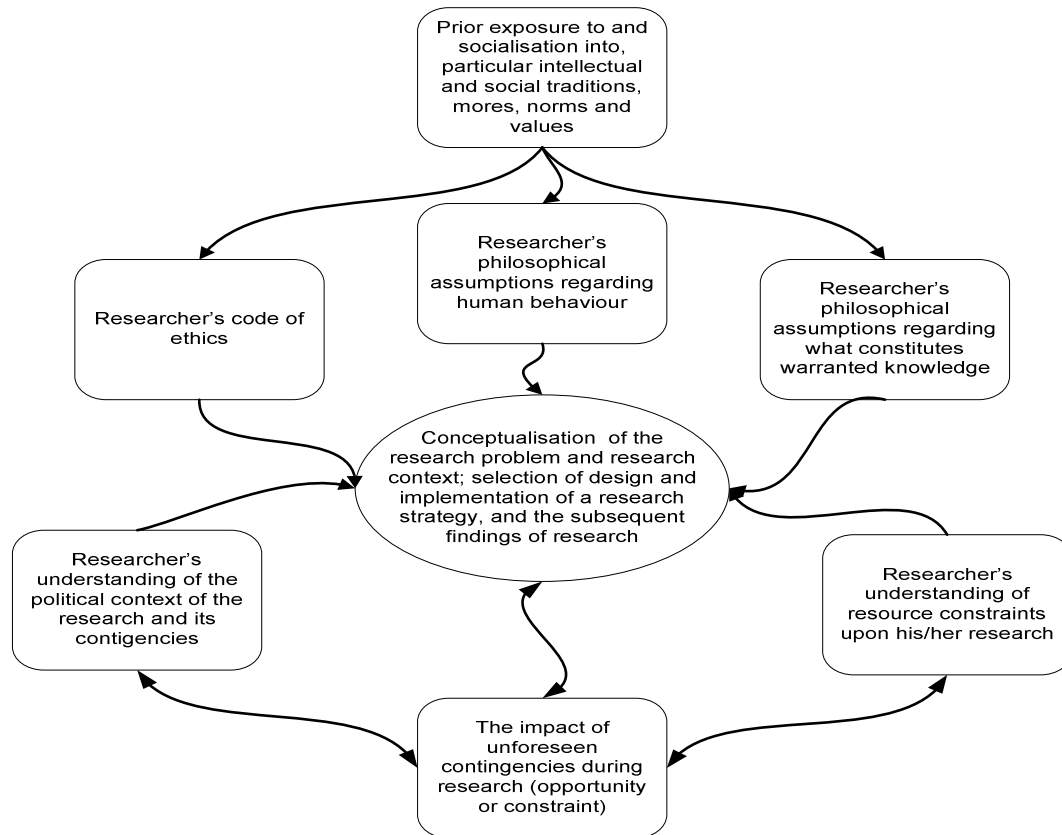


Figure 3-3: Influences on choice of research design (Gill & Johnson, 1991)

3.2.1.1. Ontological and Epistemological Choice: Critical Realism

In research the choice of ontological stance is not typically made explicit as it is often assumed by existing beliefs (personal construct), assumptions (described in **Figure 3-3**) and the inferred epistemological stance of a researcher. The researcher believes that through understanding it is possible for an individual to adjust their natural stance to meet the needs of a research. This adjustment in itself is part of the knowledge seeking process or epistemology. Therefore, despite the researcher having an existing comfort zone and training in positivistic constructs, the philosophy most suited to this research question is, in the main, allied to Critical Realism and thus the approach used for the research was closely matched to this. Whilst this required an adjustment in mindset; the researcher's positivistic training is evident in the overall research design and it is believed that the research has been enhanced through using strengths of both approaches.

According to Blaikie (1993) the ontological assumptions of approaches to social enquiry can be divided into two groups – Realist and Constructivist. Both approaches have been reviewed with consideration for their implications to epistemology and have been summarised on **Figure 3-4**. Though it appears that some of the epistemological approaches share the same ontological assumptions, it is not strictly true as they may differ in their beliefs of what elements constitute social reality. Whilst Critical Realism shares a realist ontology that social reality exists independently of the observer and its uniformities can be observed and explained (Blaikie, 1993), it also partly shares the constructivist view that all knowledge is socially constructed as it does not necessarily reflect any external realities. Critical realism however takes this constructivist view further by making a distinction between the domains of the empirical (events which can be observed without being activated), the actual (events that are activated whether or not they are observed) and the real (the structures and mechanisms which activate / counteract these events that result in unpredictable effects – thus a non-observation in contrast to positivistic signification of its non-existence). **Table 3-1** is an adaptation of from Bhaskar (1975) on these domains of reality. Hence realist science aims to explain observable phenomena with reference to underlying structures and mechanisms (Blaikie, 1993) by reflecting scientific practice while at the same time avoiding its fatal flaws (Harre, 1986). It recognises that there are fundamental differences between natural and social phenomena and so concerns itself with developing methods appropriate to the particular subject matter of social science that are based on realist principles (Blaikie, 1993).

Table 3-1: Bhaskar's Domains of reality

	<i>Domain of empirical</i>	<i>Domain of actual</i>	<i>Domain of Real</i>
Experiences	✓	✓	✓
Events		✓	✓
Mechanisms			✓

As a result there are essential choices (**Figure 3-5**) in the next paragraphs that have been made by the researcher with regards to the research problem. Although some of the choices are more representative of either approach (i.e. realist or constructivist), the

researcher's perspective is that there is no right (or wrong) answer but one that addresses the requirements of the research problem, its social context and its phenomena. Thus some of the choices are represented on a continuum scale, some were mutually exclusive and others are decisions that were found to be appropriate under certain conditions, all accordingly with the research question as stated below.

Research Question

How should manufacturing organisations decide on what strategic concept to adopt in their supply chain environment in order to respond to market change and/or position the firm in the market for long-term competitiveness?

Starting point

A Critical Realist approach consists of three- phrases of development of which the identifying the phenomena from science, constructing explanations for it and testing the explanations empirically to identify generative mechanisms at work. These generative mechanisms become a phenomenon to be explained and the process is a continuing dialectic ((Blaikie, 1993) after Bhaskar 1978). This is reflected in the research design in that the researcher's observation (from previous experience) lead to the identification of a phenomena from literature, this was developed into a theoretical framework with explanations that need to be tested in order to identify the generative mechanisms at work. These generative mechanisms in turn have had to be explained and the whole process could be continued except for the time limitations of a PhD program.

Role of language

In Critical Realism, the role of language is more towards a 1:1 correspondence with reality. Bhaskar (Blaikie, 1993) describes linguistic fallacy as the failure to recognise that there is more to reality than is expressed in the language of the social actors. This hints at the need to define constructs within this research in a positivistic manner and then review it within the concept of human and social totality (i.e. stratification of the personality, transactions between human nature, social structure and material transactions with nature) (interview with Bhaskar, 1999).

	Realist	Constructivist
Basic beliefs	<ul style="list-style-type: none"> Social reality exists independently of the observer and the activities of social science → the world is external and objective Reality is ordered The uniformities of the reality can be observed and explained Observer is independent Science is value-free 	<ul style="list-style-type: none"> Social reality is produced and reproduced by social actors → the world is socially constructed and subjective Social reality is a preinterpreted, intersubjective world of cultural objects, meanings and social institutions There may be multiple realities Observer is part of what observed Science is driven by human interests
Allied epistemology	<ul style="list-style-type: none"> Positivism Critical Rationalism Realism 	<ul style="list-style-type: none"> Interpretivism Critical Theory Structuration Theory Feminism Realism
Researcher should	<ul style="list-style-type: none"> Focus on facts Look for causality and fundamental laws Reduce phenomena to simplest elements Formulate hypotheses and then test them 	<ul style="list-style-type: none"> Focus on meanings Try to understand what is happening Look at the totality of each situation Develop ideas through induction from data and generate new theories
Preferred methods include	<ul style="list-style-type: none"> Operationalising concepts so that they can be measured Taking large samples 	<ul style="list-style-type: none"> Using multiple methods to establish different views of phenomena Small samples investigated in depth or over time
Data Collection	<ul style="list-style-type: none"> Tends to produce quantitative data Tends to use large samples Data is highly specific and precise The location is artificial 	<ul style="list-style-type: none"> Tends to produce qualitative data Tends to use small samples Data is rich and subjective The location is natural
Validity	<ul style="list-style-type: none"> Does an instrument measure what it is supposed to measure? Internal Validity is low 	<ul style="list-style-type: none"> Has the researcher gained full access to the knowledge and meanings of informants? Internal Validity is high
Reliability	<ul style="list-style-type: none"> Will the measure yield the same results on different occasions (assuming no real change in what is to be measured)? Reliability is high 	<ul style="list-style-type: none"> Will similar observations be made by different researchers on different occasions? Reliability is low
Generalisability	<ul style="list-style-type: none"> What is the probability that patterns observed in a sample will also be present in the wider population from which the sample is drawn? Generalises from sample to population → high 	<ul style="list-style-type: none"> How likely is it that ideas and theories generated in one setting will also apply in other settings? Generalises from one setting to another → low

Source: Easterby-Smith et al, 1991, Blaikie, 1993, Hussey & Hussey, 1997

Figure 3-4: Realist v Constructivist

Lay accounts

The relationship between lay language and technical language is central problem in social science in that they are two languages, that of the investigator and that of the participants (Blaikie, 1993). According to Winch (Blaikie, 1993) it is the rules concerned with its interpretation by the researcher that counts and so he recommends building technical language on lay language. In Critical Realism language is fundamental, corrigible and to some extent trans-situational. This implies the need to collect data in lay language and build technical language from lay accounts. This means that the interpretations or accounts of the participants are corrigible by the researcher as the knowledge is rooted in them and it is relevant within context and so fairly situational.

Social science accounts

There are limits to the generalisability of social science accounts and a Critical Realist approach hints at qualitative research. Validity is covered in more detail at **Section 3.6.4**. The extent to which this research can be generalisable across social contexts has been conditioned by time limitations of the PhD program, access to industry and available resources. Thus three distinct social contexts were targeted due to a concern for the verification (or falsification) of the phenomena of interest.

Researcher

Critical Realism accepts the interpretive view that the social sciences have a subject to subject relationship with their subject matter while sharing a positivistic desire for producing causal explanations (Blaikie, 1993). It argues, however, that there is a distinction between a causal law and a pattern of events such that a constant conjunction must be backed by a theory (a conception or picture of the mechanism or structure at work) that provides an explanation of the link between the two events (Blaikie, 1993) after bhaskar). This hints at an emancipatory component as social science requires practical intervention in social life (Bhaskar, 1986) and by taking the role of an outside expert, the researcher can correct the interpretations and accounts of the social actors and be able to distinguish between meanings of actions and motives (beliefs about or reasons) for actions. At the same time it requires the researcher to be involved, in terms

of using their thoughts, feelings and intuitions as part of the research process as opposed to being detached and impersonal.

Objectivity

Critical Realism avoids the problems of objectivity because *'if a mechanism that is hypothesized in a model is shown to exist and act in manner postulated, then it must be true. Theories that are regarded as being are either true or false.'* (Blaikie, 1993)

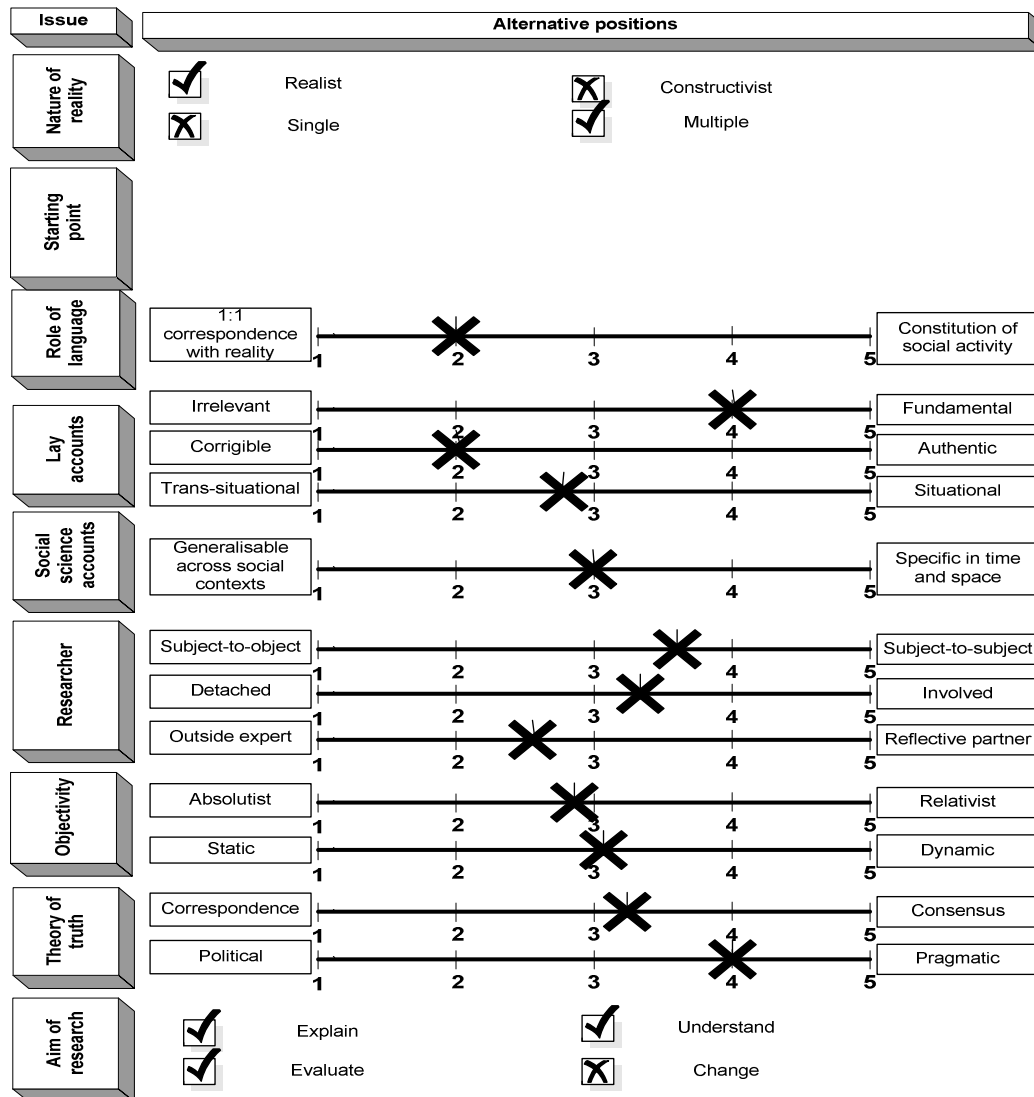
This in the view of the researcher is a slightly absolutist claim that leads to fairly dynamic postulations.

Theory of truth

Given the arguments from the previous section, a partly consensus approach will enable verification of theory. However, this theory must also be practical hence the pragmatic tendency on **Figure 3-5**.

Aim of research

As described in **CHAPTER 1**, the aim of the research can be broken down into explaining theory (i.e. the theory of responsiveness and its links with alignment), test this theory to evaluate its feasibility/ trueness/ existence, understand the practical and social contexts through identifying enablers and inhibitors, all in the hope to initiate the need for change/ improvement within an organisation. The change aspect would be an output as it would be impossible within the timescale of the research to monitor these.



Adapted from: Blaikie, 1993

Figure 3-5: Epistemological choice

3.3. Research Approach: Retroductive Strategy

Hence realist science involves a process of description, explanation, and re-description in which layers of reality are continuously exposed starting from a top layer and at lower layers. For this reason a retroductive strategy was found to be the most suitable approach. **Table 3-2** highlights the research approach based on Blaikie's seven step retroductive approach.

Table 3-2: The research approach

Baliek's retroductive approach	The research approach
1. In order to explain observable phenomena, and the regularities that obtain between them, scientists must attempt to discover appropriate structures and mechanisms	This refers to the object of the research which is the need for organisations to be responsive and the need for the researcher to understand the responsiveness phenomenon.
2. These structures and mechanisms will typically be unavailable to observation - first construct a model of them, often drawing upon already familiar sources.	The responsiveness model is constructed from existing literature in supply chain management and influenced by previous experience of the researcher.
3. The model is such that were it to represent correctly these structures and mechanisms, the phenomena would then be causally explained.	A causal relationship represented by the conceptual model of alignment and performance measurement as key enablers to responsiveness.
4. Test the model as a hypothetical description of actually existing entities and their relations. To do so work out further consequences of the model (i.e. additional to the phenomena to be explained) that can be stated in a manner open to empirical testing.	The model needs to be tested in more than one supply chain to verify the existence of these structures and mechanisms. The findings result in further causal relationships to be further researched.
5. If these tests are successful, this gives good reason to believe in the existence of these structures and mechanisms.	The results are presented in Part V and it is stated if some the mechanisms have been verified or falsified.
6. It may be possible to obtain more direct confirmation of these existential claims, by the development and use of suitable instruments.	It is believed that a cross-sector survey is required to increase generalisability across broad social contexts.
7. The whole model-building process may be repeated, to explain the structures and mechanisms already discovered.	Subject to time limitations findings from prior cases were checked for verification of their existence following ones.

3.4. Choice of Research Methods

Of the many research methods that were considered, case study and action research were found to be methods most suitably aligned to the research question. These are therefore discussed in the next two sections in terms of research design considerations highlighted in the previous sections as well as their pros and cons and their implications for the research.

3.4.1. Case Study v Action Research

Case study and action research methods have been considered together because both methods are viable for addressing the research question and are considered to be separate methods in management research.

Arguments from previous sections in this chapter regarding the realist stance about the need for practical intervention; the subject-to-subject context; consensus of truth and; the fundamentality of lay accounts hints at a research method that supports some level of emancipation hence action research. On the other hand, the corrigibility of lay accounts; the need to use outside expertise; objectivity requirements and; the allusion at retrospective review makes a good argument for a case study method.

Yin (1981) suggests that a case study is useful when '*examining a) a contemporary phenomenon in its real life context, especially when b) the boundaries between phenomenon and context are not clearly evident.*' This requires the researcher to be detached and not to affect or interfere with that which is being studied. It also implies that it is a method employed when it is highly pertinent to cover contextual conditions of the phenomenon of study (Yin, 2003). Action research, on the other hand, requires the researcher to be actively involved in planning and introducing some change in policy, and then in using their research expertise to monitor and possible to evaluate its effect. Action research method provides a richness of insight that which could not be gained in other ways leading to the development of emergent theory (Eden and Huxham, 1996; Coughlan and Coughlan, 2002).

Lewin (1946) is credited to be the first to use the term action research and it has since been explained by researchers in numbers of ways. Nevertheless three common themes have been found within literature (Saunders et al, 2000). Firstly there is an emphasis on the purpose of the research: the management of change (Easterby-Smith et al, 1991;

2003; Cunningham, 1995). Secondly there is the involvement of practitioners and researchers working collaboratively. Eden and Huxham (1996) deduce that the research output results from *'involvement with members of an organisation over a matter, which is of genuine concern to them'*. Thus the researcher is part of the organisation within which the research and change process are taking place (Zuber-Skerritt, 1996). The third theme suggests that action research should have implications beyond the immediate project and so must be clear enough that the results could inform other contexts. Having also the knowledge that there may be unintended consequences following such implementation (Sekaran, 2003). For academics undertaking action research, Eden and Huxham (1996) link this to an explicit concern for the development of theory. However they emphasise that for practitioners this is more likely to focus on subsequent transfer of knowledge gained from one specific context to another. For this reason, action research differs from other forms of applied research because of its explicit focus on action, in particular promoting change within the organisation (Saunders et al, 2000; Gill and Johnson, 1991). Furthermore the researcher is involved in this action for change and subsequently application of knowledge gained elsewhere. The effects are evaluated, defined, and diagnosed, and the research continues on an ongoing basis until the problem is fully resolved (Gill and Johnson, 1991).

In contrast, an explanatory case study consists of: (a) an accurate rendition of the facts of the case, (b) some consideration of alternative explanations of these facts, and (c) a conclusion based on the single explanation that appears most congruent with the facts (Yin, 2003). In this respect and in respect of the research question both methods can be complementary in that whilst case study focuses on theory expansion and generalisation (Yin, 2003), action research focuses on theory generation (Eden and Huxham, 1996). It is believed that the combination of both methods can address the requirements of the research question in that a case study method is useful to understanding, empirically, how the theoretical framework can be used to deliver long-term competitiveness (verification or falsification of its existence); and the action research method can be designed to strengthen theory building from the case study (Yin, 2003; Eisenhardt, 1989) by helping to identify and understand specific factors that were enabling and inhibiting the theoretical process of alignment (hence the underlying structures and mechanisms). Both methods would contribute to knowledge by identifying areas for

improvements for the theoretical framework and an enhanced understanding of alignment to managers of supply chain processes. To do this both methods require some procedural and systematic style in their design (**Table 3-3, Table 3-4**) in order to ensure rigour; require a solution to researcher bias issue; require focus on theoretical propositions and not populations or universes; require defined methods for collecting data. **Table 3-3** and **Table 3-4** exhibit the strengths and risks if both methods (extracted from various literature). They show that both methods more or less share similar risks however their strengths are different. It is believed that by employing a two-phase empirical study that addresses these risks in its design, the strengths of both methods can be realised.

Table 3-3: Case study strengths and risks

CASE STUDY	
STRENGTHS	RISKS
Flexibility Emphasis on context Appropriate for expanding theory Links context with phenomena High in internal validity Avoids problem associated with experimental artefacts	Potential lack of rigour due to an unsystematic approach Temptation to deliberately alter material to demonstrate a particular point Little basis for generalisation May take too long May lead to lengthy narrative Low ecological validity Often external validity is limited to subjects involved

Table 3-4: Action research strengths and risks

ACTION RESEARCH	
STRENGTHS	RISKS
<p>Helps to resolve some of the practical concerns of organisations trying to deal with a problematic situation.</p> <p>Avoids problems associated with experimental artefacts</p> <p>Can be very high in ecological validity</p> <p>Good for generating theory</p> <p>Good for explaining ‘what is going on’ in particular social situations</p> <p>Heightens the researcher’s awareness of significant social processes</p> <p>Can lead to applicable research</p> <p>Virtually all data collected are useful</p>	<p>Academic legitimisation</p> <p>Loss of control over extraneous variables</p> <p>External validity limited to subjects involved</p> <p>Internal validity limited to researchers intervention</p> <p>Can be very time consuming</p> <p>Can pose difficult ethical dilemmas for researcher</p> <p>Can have high levels of role conflict for researcher</p> <p>Closeness of researcher to the situation can lead to significant observer bias</p> <p>Data recording can prove to be very difficult for the researcher</p> <p>Danger of destroying naturalism it is intended to study</p> <p>Danger of researcher losing focus of study due to concerns about other external variables</p>

3.4.1.1. Design implications of case study and action research

The purpose of the research is to develop an understanding of how a strategic response model can be used to deliver competitiveness (customer and shareholder value) in a supply chain. This requires a process of exploration, explanation and understanding such that it will potentially lead to change. Therefore it was deemed necessary to assess the practicality of the framework by employing the case study method in Phase One and the action research method in Phase Two. Phase One would entail an assessment of the current state of a supply chain of which data will be collected and used to test (or

analyse) the existence of the entities of the theoretical framework, its underlying structures and mechanisms (Steps 4 and 5 of **Table 3-2**). Following from Phase One, Phase Two will involve presenting these findings to the supply chain to validate the findings, promote understanding, identify new theory and initiate improvements (Steps 5, 6 and 7 of **Table 3-2**).

There are research design decisions (Easterby-Smith et al., 1991; Robson, 2002; Yin, 2003) that are of particular significance to this Two-Phase design. Some of these decisions relate to already discussed dichotomy between the use of realist and constructivist philosophies while others further embed the research question into the design. These are discussed in the following sections.

Multiple vs. single case

Yin (2003) suggests five rationales for single case and these include: critical case (useful for testing a well formulated theory), unique case (useful for testing a rare situation), representative case (useful for capturing circumstances and conditions of a commonplace situation), revelatory case (useful for observing and analysing a phenomenon previously inaccessible to scientific investigation) and longitudinal case (useful for specifying how certain conditions change over time). Alternatively, evidence from multiple cases can be more compelling, making the overall study more robust (Yin, 2003).

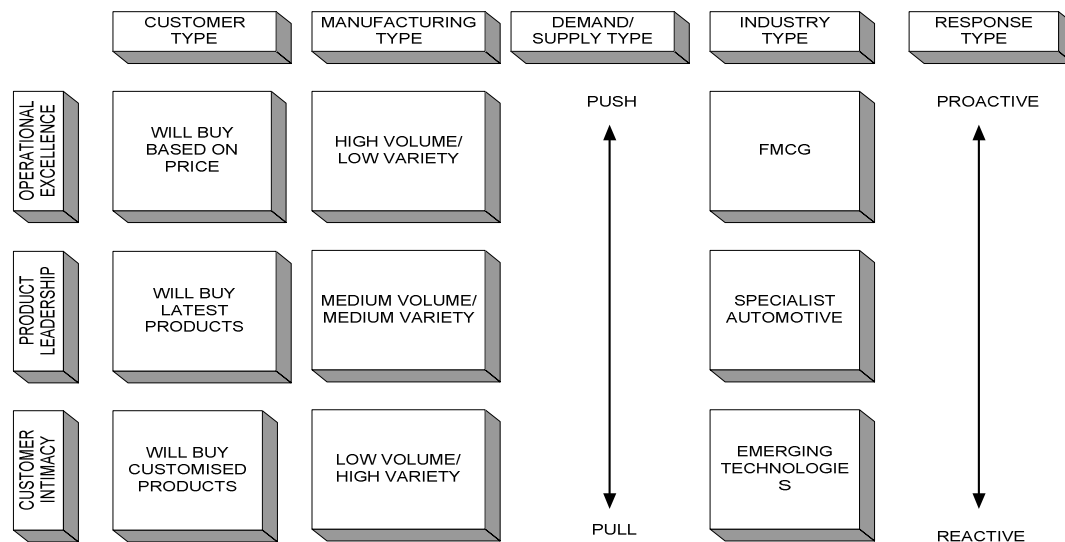


Figure 3-6: Replication logic

The decision to have multiple cases is hinted on **Table 3-2: The research approach**. With this and with consideration for the risks associated with using both case study and action research it is believed that testing the framework in three distinct supply chains can help to identify underlying structures and mechanisms that are context specific and those which are likely to be generic hence **Figure 3-6** depicts the replication logic that was used in selecting the cases. This tests if the response requirements of each supply chain are different and if the same theoretical framework be used despite their differences.

Unit of analysis

The unit of analysis has been defined by the value gaps model in **CHAPTER 2** and is partly depicted by **Figure 3-7** which defines the scope of the supply chain that is researched. This also identifies with the working definition of supply chain management described in **CHAPTER 1** as well as the phenomena of interest.

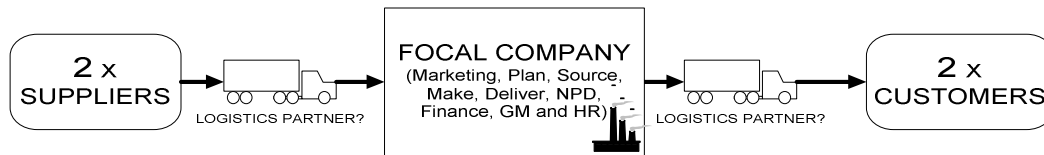


Figure 3-7: Unit of analysis

There are four distinct units of analysis for the overall research. Firstly there is the level of analysis that looks at three distinct supply chains that are defined by their market characteristics. Secondly there is the inter-organisational supply chain level of analysis. Thirdly there is the intra-organisational supply chain level of analysis that looks at cross-functional processes. Finally there is the intra-organisational hierarchical level of analysis.

Researcher is independent vs. Researcher is involved

This choice stems from whether the researcher should remain distanced from, or gets involved with, the material that is being researched (Easterby-Smith et al, 1991). It stems from the philosophical view about whether or not it is possible for the observer to remain independent from the phenomena being observed. A traditional assumption from the positivistic training of the researcher is that in science, the researcher must maintain complete independence if there is to be any validity in the results produced. In

social science, claims of researcher's independence are harder to sustain and action research assumes that any social phenomena are continually changing and thus the researcher is part of the change process itself. Therefore in Phase One the researcher defines and carries out expert diagnosis on data collected meaning a more independent role. In Phase Two, the diagnosis is presented back and opened to debate leading to joint diagnosis of the researcher's concepts (Gill and Johnson, 1991) and newly emerging issues. By reflecting back on the activities in Phase Two, new theories can be generated. **Figure 3-8** is an adaptation of Saunders et al (Saunders et al, 2000) and Robson's (2002) description of the role of the researcher. It depicts the role of the researcher in the two phases described.

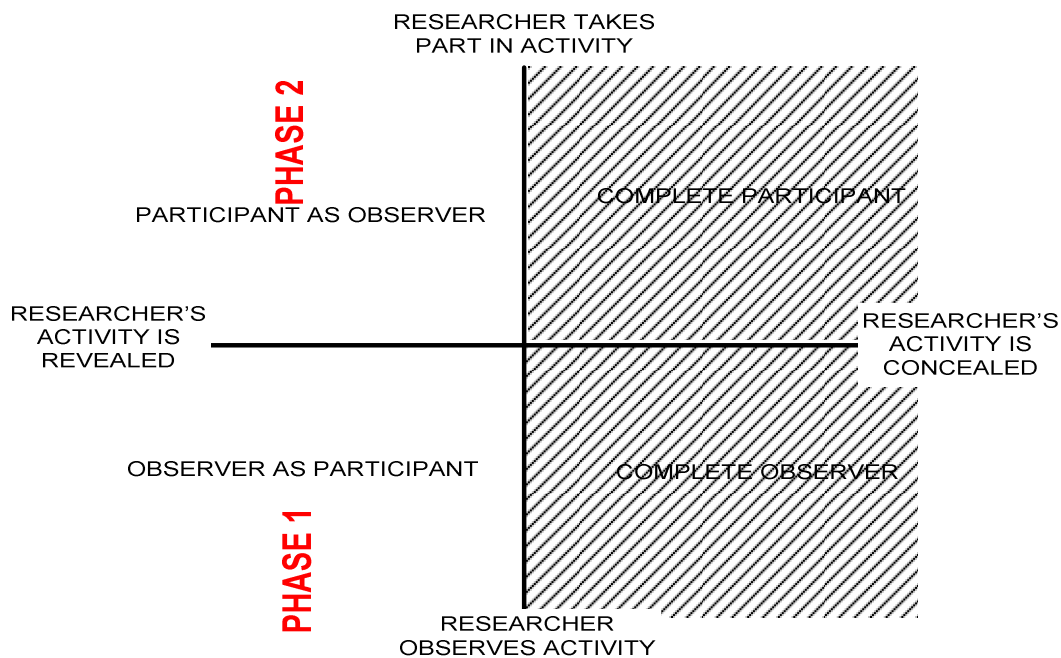


Figure 3-8: The role of the researcher

Large samples vs. Small numbers

This is the choice between sampling across a large number of organisations or whether to focus on a small number over a period of time (Easterby-Smith et al, 1991). The replication logic (**Figure 3-6**) indicates three distinct supply chains. The unit of analysis demonstrates broad spectra of participating individuals and organisations. Action research as a method tends to follow the latter in that focuses it on processes within the broader social, economic and political context to produce significant results.

This can be very time-consuming with the complexity of the data requiring high skills from the researcher involved (Zuber-Skerritt, 1996). This means that expanding beyond three cases would exhaust the limited resources on this research. It is also good practice to conduct some pilot before engaging in the cases (Robson, 2002; Yin, 2003), hence it is better to limit it to the three cases and a maximum of two pilots so that the research rigour and its credibility is maintained.

Testing theories vs. Generating theories

Both of the above options are represented in the retroductive research approach (**Table 3-2**). In Phase One, theory is being tested by using the theoretical framework to view the supply chain. Whereas, in Phase Two new theory is being generated from issues concerning validity of tested theory (i.e. the theoretical framework) and its applicability.

Experimental design vs. Fieldwork methods

Both case study and action research methods require the study of real organisations in their social settings. Taking an experimental design to the overall process would mean deliberately divorcing the phenomenon from its context (Yin, 1981). However it is possible to also use an experimental approach for the planned interventions for hypothesis testing. The issue here is that it has to be able to address the research problem since the context is part of the study and this means that there will always be too many “variables” for the number of observations to be made. The effectiveness of this depends on how involved the researcher is on the process. This introduces a third aspect into the role of the researcher that is to detach completely at the end of each case to reflect upon the findings and be specific about newly introduced variables for the next case. This retrospective review is also taken for when all cases have been completed in order to enrich the theoretical model with critical facets that may have not been picked up earlier in the study.

Fixed (Closed) vs. Flexible designs

Robson (2002) describes fixed research designs as one in which a very substantial amount of pre-specification about what the researcher is going to do, and how the researcher is going to do it, should take place before the researcher gets into the main part of the research study. They require a developed conceptual framework or theory so

that the researcher knows in advance what to look for, and extensive pilot work to establish what is going to be feasible. Even when this has been achieved, they call for a degree of control by the researcher which may not be possible.

Flexible research designs tend to be more associated with qualitative data and a variety of theoretical positions. They are also flexible in terms that much less pre-specification takes place and the design evolves, develops and unfolds as the research proceeds.

Debates around these designs link back to philosophy in terms of what is considered scientific or not. Robson advises that '*flexible designs can be characterised as scientific provided they are carried out in a systematic, principled, fashion*' and Yin (2003) cautions undertaking any alterations to the research design as it may have an impact on the original theoretical concerns.

There are two layers of the research process that are the overall design and individual case design. The proposed experimental style of the research (described above) means that the overall research design is fixed on the basis that it is testing a theoretical framework. However each individual case is taken within its context. This alludes to the importance of focusing on key issues that are important to each specific case in Phase Two. Whilst findings from each case can add new theory to the theoretical framework, the framework is not amended. Instead such findings are noted and observed in following cases. The retrospective review at the end of the study is aimed at verifying or falsifying these new theories such that the theoretical framework is enhanced at the end of the study. Moreover, although the content may be different, the approach is the same and the tools and techniques used are the same such that consistency is maintained and reliability is not jeopardised.

Guarding against bias

Reason (1988) advocates '*critical subjectivity*' - this relates to a researcher recognising their own views and experiences and its impact on clouding the research. In both case study and action research, the researcher needs to guard against the temptation to look for data that confirms the position they are holding with regards to verification or falsification of a theory. In this respect, guarding against bias is somewhat inherent in the research design. For example by declaring the role of the researcher it is clear at which stage significant bias could be introduced into the research. Also the two-phase case design leaves room for consensus theory of truth of the researcher's concepts and

findings in Phase Two. However the same cannot be said of Phase Two. Thus by adhering to the following principles, biases could be minimised and where they cannot be minimised, they are declared.

As a general rule the researcher's approach to bias within the context of this research includes: declaring ontological stance; maintaining a fixed research design as best as possible; validating Phase One findings through consensus in Phase Two; declaring recognised biases by noting disagreements and adhering to Winter's (Zuber-Skerritt, 1996) principles for action research (**Table 3-5**) for Phase Two.

Table 3-5: Summary of Winter's principles

PRINCIPLE	STEPS
<i>Reflexive critique:</i> the researcher becoming aware of their own perceptual biases.	<ul style="list-style-type: none"> ▪ Systematically reflect on the research method according to purpose and context ▪ Note perceptions of the way in which researcher's values and ideological and epistemological positions influenced the selection, interpretation and analysis of data. (Relevant personal and professional background and experiences) ▪ Document growing relationships between researchers and the researched. (Irrelevant as Phase Two was a two day workshop) ▪ Recognise and attempt to offset the privileged position in researcher's style of theorising.
<i>Dialectic critique:</i>	<ul style="list-style-type: none"> ▪ Background profiles to understand the relationships between the elements that make up various phenomena in an individual's context.
<i>Collaboration:</i>	<ul style="list-style-type: none"> ▪ Everyone's view is taken as a contribution to understanding the situation. ▪ Everyone's view is not synthesised into a consensus rather variety of differences between viewpoints makes data rich. ▪ These viewpoints are initially regarded as part of data and give weight to understanding and developing feasible actions.
<i>Risking disturbance:</i>	<ul style="list-style-type: none"> ▪ Record provisional interpretations of the situation as data. ▪ Note decisions on what is and what is not relevant

Critiquing researcher's taken-for-granted processes.	<ul style="list-style-type: none"> ▪ Note anticipations of the sequence of events through which the fieldwork will pass. ▪ Present viewpoints in Phase Two and open to critique allowing the contradictions in viewpoints to lead to change.
<i>Creating plural structure:</i>	<ul style="list-style-type: none"> ▪ Developing various accounts and critiques, rather than a single authoritative interpretation.
<i>Interdependency of theory & practice:</i>	<ul style="list-style-type: none"> ▪ Question the reflective bases upon which decisions are carried out, to offer reflexive and dialectical critique on the possible actions that were ignored. So theory questions practice and practice questions theory

3.5. Time Horizons

The time horizon of the research is best described as a cross-sectional study. Although longitudinal studies provide the capacity to study change and development (Saunders et al, 2000), the time constraints of a PhD in combination with the research design decisions makes a cross-sectional study more feasible than a longitudinal study. The pilot case also indicates the benefits of doing this, in that the researcher does not get too involved as it can create ethical dilemmas.

3.6. Data Collection Methods

As implied in previous sections of this chapter, there is a constant interplay between theory testing, findings, effects and consequences. This means that creative and realistic ways of collecting data are critical to the design.

3.6.1. Types of Evidence

Phase One involves the assessment of the current situation of the case company and identification of the problem area. At this phase, the researcher collects and analyses initial data that will lead to the identification of the phenomena for the company. With the role of the researcher being that of an 'observer as participant' (Robson, 2002), the types of evidence collected includes: noting discussions with participants, jotting down insight as they occur to the researcher from observation; collection of documents relating to a situation; observation notes – checklists; semi structured interviews (taped);

written validated descriptions of meetings / interviews; archival records (including website and external sources), physical artefacts.

Phase Two is organised in the form of a workshop whereby the researcher presents Phase One analysis to get some feedback and raise discussions on what needs to be applied. This has meant that the researcher cannot be fully detached from the process as it allows the researcher to be able to question the subjects to enhance understanding whilst the key informants are likely to adopt a perspective of analytical reflection on the processes in which they are involved. Evidence collected at this phase include: issues list (on flip chart), noting responses from individuals involved in the process (on theory, on application and body language in which it was communicated); using interactive exercises to encourage participation from all involved.

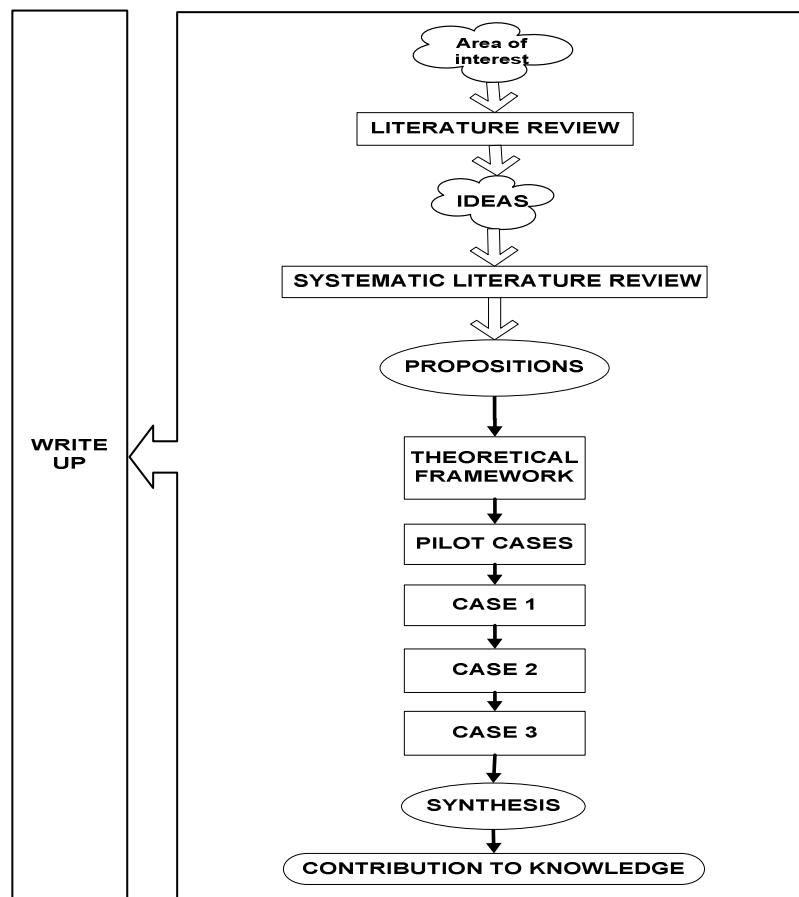


Figure 3-9: Research process

3.6.2. Triangulation

Section 3.6.1 indicates the use of multiple sources of evidence. The use of multiple sources of evidence not only helps to address a broader range of historical, attitudinal and behavioural issues but it enhances the strength of the study through the development of converging lines of enquiry adding credibility to the findings and conclusions of the study (Yin, 2003). Two types of triangulation (Yin, 2003) that are possible and are employed in this study include: *the triangulation of data sources* – evidenced in the use of multiple data sources; *the triangulation of perspectives to the same data set* – evidenced in the interview style of which all interviewees were subject to the same questions, also evidenced in the co-development that occurs in Phase Two.

3.6.3. Analysis

3.6.3.1. Techniques for within-case analysis

Although the case begins with a framework, each narrative is organised around specific propositions, questions, or activities with flexibility provided for modifying these topics as analysis progresses. The narrative is time ordered (Miles and Huberman, 1994) in terms of phases. As for integrating evidence, quantitative and qualitative data that address the same topic are assembled together; similarly, interview segments from different respondents but on the same topic are integrated from a role display (Miles and Huberman, 1994) analysis. The response of each participant is aligned with the phenomena to create the role display. The next step is to use the other data to enhance the evidence coming out of this display

3.6.3.2. Techniques for cross-case analysis

Yin recommends that, first, isolated factors within particular case studies must be worthy of substantive attention, second, the number of case studies must be large enough to warrant cross-case tabulations. However, the number of factors worthy of examination is often large relative to the number of case studies available, producing a shortage of sampling points for identifying any statistical interaction effects. Also, the extraction of single factors from a case study unduly simplifies the phenomenon being studied. Therefore, treating the cases as if they were data points, with each case yielding an observation to be tabulated is the preferred technique.

3.6.4. Validity

The validity of a research proposition can take many forms depending on the research question and how the research design allows that question to be satisfied. Five forms of validity are addressed in this research and are discussed in the next paragraphs.

3.6.4.1. Reliability

McNeil (1990) warns that *'Any method that involves a lone researcher in a situation that cannot be repeated, like much participant observation research is in danger of being thought unreliable.'* Reliability concerns the demonstration that the operations of a study such as the data collection procedures can be repeated, with the same results even with another user and its goal is to minimise errors and biases in a study (Yin, 1993). This is reflected in the design of the study through the records kept on interview documents, the recording and transcription of interviews and workshops and other documents with their sources. In Phase Two, the same approach was used in all cases in that theory is presented using the situation of the case, and feedback and discussions followed with the researcher making notes on what each participant is contributing.

3.6.4.2. Construct validity

Yin (1993) describes construct validity as *'establishing correct operational measures for the concepts being studied'*. It refers to the problem of whether the data collected is a true picture of what is being studied. The richness of the context in each case allows the researcher to be able to reflect on other underlying structures and mechanisms existing within the context that may be having an impact on the findings before concluding that the data is indeed the evidence of what is being studied. In Phase Two particularly the data collectable could be attributed to being a product of the research method used. This impact is minimised by systematically designing and using processes such as reflexive critique, dialectic critique, risking disturbance and triangulation.

3.6.4.3. Internal validity

This involves establishing a causal relationship whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships (Yin, 1993). This

is evidenced in Phase Two where causal relationships from Phase One are validated. However, causalities in Phase Two cannot be validated, whilst it was possible to predict and recognise the impacts of planned interventions, there are also other conditions which are beyond the researcher's control and so some of the outputs of Phase Two are more to do with predictions and generating theory.

3.6.4.4. External validity

This requires establishing the domain to which a study's findings can be generalised (Yin, 2003). By testing the theoretical framework in three distinct supply chains, there can be some findings that are found to be generic to all three supply chains and some that are specific to each supply chain or industry. However, this sample size of three cannot represent all existing supply chains thus the study is reliant upon analytical generalisations. So it cannot be claimed that the conclusions have any relevance to any other context as it is not known whether they are representative. Phase Two will require the researcher to generalise a particular set of results to some broader theory. Such theory will need to be tested by replicating the findings in other environments and even so the results may only be acceptable for a larger number of similar environments.

3.6.4.5. Ecological validity in action research

Gill & Johnson (1991) describe this as the extent to which conclusions might be generalised to social contexts other than those to which the data has been collected. The case study method and action research method compared to other methods are good arguments for ecological validity. This is because, in experiments, how people behave can be modelled in an unreal world; however this behaviour cannot be guaranteed the real world. The richness of ecological validity in this study means that the same application of the theory will yield similar results in similar social environments.

3.7. Overall Implications For This Research

3.7.1. Limitations of Research Design

The research project was subject to the usual vicissitudes of social science research. However action research is a heavily criticised research method. Much of critique on action research is not based upon what action researchers do in practice, but on the

theoretical positioning of epistemological bases for action research. The following are some issues raised by McTaggart (Zuber-Skerritt, 1996):

Popular knowledge and academic legitimisation: Some researchers dispute the need for popular knowledge to be justified epistemologically by approval from academy, others recognise the issue and have worked to complement and reciprocate popular and academic knowledge.

Postmodernism: Action research is considered as a reaction to modern developments. In comparison to other research methods, it is seen to lack identity, objectivity and certainty.

Subjectivity: This addresses the lack of evidence/arguments that can be adduced to support (or contest) the contention that action researchers can be regarded as autonomous and responsible agents of change (individually or in a group) and as persons autonomously capable of constructing knowledge which can guide their own reconstructive activities.

History: This requires evidence to be adduced to support (or contest) the contention that the readings (understandings) of progress by participants, improvement and emancipation shaped by their own (self-) interests and their own perspectives rather than regimes of truth and discursive practices that pre-form participants' ways of viewing themselves, their understandings, their practices and the settings in which they work.

Metaphysics: This deals with evidence/ arguments can be adduced to support (or contest) the contention that action researchers representations of themselves, their understandings, their practices and their situations may be regarded as socially and historically constructed and reconstructed through communicative action. Also, if they are amenable to objective and subjective part of a reconstructive program.

Proliferation of action research: Action research is most common in professional education but has been used in a variety of fields. Its widespread use has led to the diversification and articulation of action research theory and practice.

Action research as a procedure: There are no formalised procedures on how to go about action research. Most writers give a guideline. McTaggart (Zuber-Skerritt, 1996) argues that "action research is not a 'method' or 'procedure' for research but a series of commitments to observe and problematise through practice a series of principles for

conducting social enquiry.” However, Zuber-Skerritt (1996) does propose a cycle of ‘plan → act → observe → reflect as a process for doing action research whilst Gill & Johnson (Gill and Johnson, 1991) prescribe some stages of action research. Researchers are therefore left to design and define what action research means to them.

3.7.2. Deconstructing the Research Question

The research question is hinting at a need for a decision making tool that organisations can use to determine how to design their supply chains to respond to changes in the market place while maintaining long term competitiveness. It cannot be a fixed tool, it has to be dynamic as responsiveness is about being able to react to a constantly evolving market. For this reason the research hypothesis can be derived as below.

Research hypothesis

A strategic response model can help alleviate the problem of deciding what strategic concept to apply within a supply chain. An organisation that can decide how responsive it needs to be to its market is able to design its supply system around that level of responsiveness. However it needs to maintain focus on its market driven goal to have a higher chance of long-term survival and sustain growth.

The response model can be used as a tool to effectively predict the response that is required by a dynamic supply chain in operation or during its design. It can furthermore, aid decisions on the manufacturing paradigm that is best suited to the pre-determined response requirements.

The dynamic nature of a supply chain system in operation means that the demonstrated response of any organisation can only be effectively evaluated by the use of such a generic model. This is in opposition to a system of organisations following general trends in paradigm shifts.

3.7.3. Choice & Implications for the Research Methodology

The research process (**Figure 3-9**) indicated in this chapter begins with a literature review to identify work that has been done in the subject area in order to define the research focus. The findings from the literature review identified the gap that the

research set about to fulfil. These ideas are presented initially in the form of a conceptual framework that is further reviewed, systematically, to produce a set of propositions and a theoretical framework that is tested using case study and action research methods.

The researcher believes that the prescribed research design is the preferred way that is most likely to achieve the research aims. The supply chain concept has often been addressed scientifically. However supply chain management, in practice, is clouded by social factors that inhibit its realisation. Hence studying it within an experimental setting (or outside its real life context) will not enhance understanding nor contribute much in terms of applicability. Although the researcher accepts the constructionist view that there can be multiple realities in any social situation, the approach taken was to narrow the scope of the phenomena being observed and assume a realist view of the social phenomena by monitoring discrete events in a positivistic manner before applying the meanings of the impacts of other social realities to the phenomena being observed. This calls for a retrospective look at the data gathered at Phase One, analysis; Phase Two presentations and participation; and retrospective look at Phase Two. The most complex aspect of this research was found to be human nature. It is hard to predict what will happen, how they will react, what motives drive people to behave in certain ways. Hence the nature of this research is primarily to enrich understanding rather than define scientific laws.

A common misconception is that case studies are solely the result of observer as participant, yet what is not often noted in participant observation is the impact that 'being observed' has on the participants of the study. Action research on the other hand acknowledges this through reflexivity. The researcher believes that action research is a further extension of case study methods and by addressing the risks associated with action research a combination of the strengths of observer as participant and that of participant as observer can be enhanced. In this case the strengths of case study method are used to address the risks associated with action research. The data collection techniques add to academically legitimising the study as it is a fairly structured and detached approach. Activities where the researcher gets involved are declared and observation notes are recorded and declared as the perspective of the researcher. Doing this and keeping the research design and data collection techniques largely fixed helps

to minimise loss of control over extraneous variables. This means that the researcher has had to accept that external validity limited to social contexts involved and internal validity limited to researcher's intervention. The researcher's intervention was kept to a minimum (one day workshop per case) as more interventions lead to means more unstructured data that can be very time consuming to justify; can pose difficult ethical dilemmas; can have high levels of role conflict for researcher; and can lead to significant observer bias. This is most especially as data recording at interventions required a lot of pre-planning in order to vindicate epistemological approval from academia. This was difficult as the researcher is expected to participate as well as note context and content information.

Other issues of concern, related to the design, include its presentation and its contribution to genuine improvement. Some considerations about its output style and how it affects the acceptance of the research within academia and external to it, suggests that presenting it as a two-phase case study helps to clarify limits to validity of each finding. To contribute to genuine improvement, means conformity to ethical aspects of the research method as described by the referenced authors in this chapter. This means adhering to already developed operational ground rules (for e.g. Winter's principles (Zuber-Skerritt, 1996)). Despite this, in both instances (of case study and action research) there is little way of screening or testing for the ability of an investigator to conduct both methods.

3.8. Chapter Summary

The purpose of the research is to develop an understanding of how a strategic response model can be used to deliver competitiveness (customer and shareholder value) in a supply chain. This requires a process of exploration, explanation and understanding such that it will potentially lead to change. Therefore it was deemed necessary to assess the practicality of the framework by employing both case study and action research methods. The case study phase tests the theoretical framework that is validated by action research in the next phase. Dialectical, reflexive, questioning, collaborative forms of inquiry in the action research phase creates various accounts and critiques ending not with convincing conclusions but with questions and possibilities that are relevant in various ways for readers of the study as Winter (Zuber-Skerritt, 1996)

suggests that they are an extension of the research collaborators. The overall research process employed can be described as a retroductive approach which supports the realist stance that is taken to address the research problem. The research process diagram can be found on **Figure 3-9**.

CHAPTER 4.**Strategic Response in Supply Networks**

The purpose of *Chapter 4: Strategic Response in Supply Networks* is to:

- Describe the systematic literature review process following on from the findings from **CHAPTER 2**.
- Determine what qualities would be required of the proposed framework and what aspects of it can be tested in order to meet the requirements of the research aim and objectives.
- Address the first objective of the research of defining responsiveness by determining its context, enablers and inhibitors within the context of inter-organisational relationships. This includes specifying the findings of the systematic literature review.
- Define and describe the development of the proposed market responsiveness model.

4.1. Systematic Literature Review Process

The initial review of literature in **CHAPTER 2** points at the need to model responsiveness in order to satisfy the research problem. To do this it was deemed necessary to conduct a Systematic Literature Review in the fields described on **Figure 4-1** so as to derive a theoretical framework for a market responsiveness model. The Systematic Literature Review was a preferred method because supply chain management, performance management and competitive strategy are broad subject areas. By deciphering the extent to which responsiveness, competition, strategic alignment and performance management has been researched within the context of supply chains, the output of the review can inform the research and wider communities on the attributes of responsiveness, its enablers and inhibitors forming an initial basis of a market responsiveness model.

A systematic literature review is a review on evidence on a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant primary research, and to extract and analyse data from studies that are included in the review (NHS Centre for reviews and Dissemination, 2001). The Cranfield Systematic Review Process (Denyer, 2004) consists of five basic stages that include:

- 1) *Planning the review* – This includes forming a review panel, mapping the field of study and producing a review protocol in order to scope the required literature within the field of study.
- 2) *Identifying and evaluating studies* – This requires the researcher to conduct a systematic search and evaluate existing literature within the field for relevance and quality.
- 3) *Extracting and synthesising data* – at this stage a selection of the high quality and most relevant literature are perused, analysed and synthesised to form the output of the review.
- 4) *Reporting* – The output is in the form of a written report.
- 5) *Utilising the findings* – The findings are then used to inform research /practice.

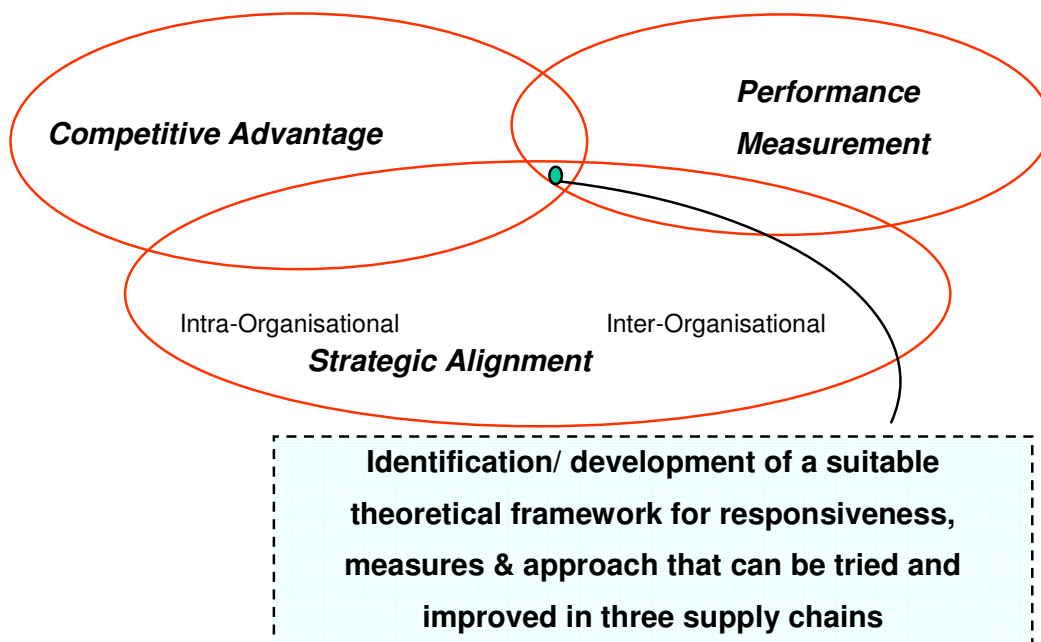


Figure 4-1: Mapping the field of study

The rest of Chapter 4 covers the output of the systematic literature review.

4.2. Deconstructing Market Responsiveness

‘Responsiveness’ is seen as a desirable attribute of a supply chain system. Virtually every manufacturing organisation wants it, but finds it difficult to define, predict or measure. Most researchers tend to describe an aspect of it which indicates that there is a gap in research for a comprehensive model.

It is an accepted term that is used in supply chain management, manufacturing management, and customer management. In these areas it is used as a word that represents satisfying the customer/market. A search, on the term responsiveness, produced the results on **Table 4-1** in the field of supply chain management.

Table 4-1: Search term in ABI Proquest 8th September 2004

Respons* AND NOT Responsib* AND Supply Chain*

Source	Percentage	Number
Scholarly Journals	26%	303
Magazines	4%	42
Trade Publications	58%	691
Newspapers	10%	123
Reference reports	< 1%	2
Dissertations	1%	13
TOTAL		1182

CHAPTER 2 describes the need for a market sensitive approach to appropriating customer value and shareholder value hence the preference for ‘market responsiveness’ as a term. This way responsiveness becomes a desirable attribute of a supply chain, that is driven by or driving market needs and not just by the advances in technology or trends in paradigm shifts.

The literature review within the subject area found few definitions for responsiveness. Despite it being a widely used term much of the literature has focussed on how to improve aspects of responsiveness with little describing what it really is. Also it has

often been confused with agility, flexibility and customer closeness (Shaw et al., 2003; Holweg, 2005; Sharifi and Zhang, 1999; Randall et al., 2003).

Table 4-2 lists some definitions of responsiveness found from operations management literature and this shows, potentially, that there are different layers & scope to responsiveness. Whilst some authors describe responsiveness predominantly as a process for delivering customer value, others see it as being able to manage disturbances. The issue with some of these definitions is that they do not actually state or aid a better understanding of what responsiveness is even within the context that it is being used. Some of the definitions above have used the word respond or response in them and some are describing what it encompasses. A dictionary definition is as follows:

Response: a reaction

Responsive:

1. Said of a person: ready and quick to react or respond.

Thesaurus: alert, awake, reactive, receptive, forthcoming, sensitive, respondent, alive.

2. Reacting readily to stimulus.

3. Reacting well or favourably to something.

4. Made as or constituting a response.

Respond: (respond to something) to react favourably or well to it.

Respond:

verb responded, responding

1. To answer or reply; to say something in reply.

Thesaurus: reply, answer, react, reciprocate, answer back, come back, acknowledge, counter, retort, return, rejoin.

2. To react in reply to something.

3. To react favourably or well to it.

Form: respond to something (usually)

Also, an extract from the Collins Thesaurus (1990) is as follows:

Respond: acknowledge, act in response, answer, come back, counter, react, reciprocate, rejoin, reply, retort, return. [Antonyms: ignore, remain silent, turn a blind eye]

Response: acknowledgement, answer, comeback, counterblast, feedback, reaction, rejoinder, reply, retort, return, riposte

Responsive: alive, awake, aware, forthcoming, impressionable, open, perceptive, quick to react, reactive, receptive, sensitive, sharp, susceptible, sympathetic. [Antonyms: apathetic, impassive, insensitive, silent, unresponsive, unsympathetic.]

The literature exposes different views on responsiveness that contribute to fulfilling the responsiveness construct. To improve responsiveness, from a manufacturing systems perspective, Mileham et al (1999) focus on improving changeover time in manufacturing as a precursor to an environment where 'lean responsive manufacturing' can take place. They believe that this can be achieved through increased flexibility, lead time reduction and the design of machines, tooling, and products in order to meet rapidly changing market demands. Whereas Gindy & Saad (1998) focus on the hidden flexibilities within a manufacturing system as means to improve responsiveness. Blumenfeld et al (1999) describe the manufacturing response time as the time taken for an order to be delivered to a retailer once it has been placed and includes the processing, production and delivery times. From their analysis they subscribe that the longer the response time the larger the inventory must be to accommodate these fluctuations. Shaw et al (2003) see responsiveness as the reactive component of agility that requires recognising the existence of a particular disturbance and then making an appropriate decision to deploy or not deploy further capabilities to mitigate its effects. They also concede that in order for a manufacturing organisation to be responsive it will need to design in flexibilities such as buffer stocks and changeovers into its system. Matson & McFarlane (1999) also take a similar approach and see factors that influence responsiveness as recognition capability, plant capabilities and decision-making capability. They design an audit approach for responsiveness that is intended to help a company to evaluate its current ability to handle the disturbances affecting its production performance and decide appropriate actions for improving its responsiveness. They also see flexibility as an inherent property of the system which can be seen as one key capability enabling responsive behaviour. Their work aimed at interpreting production system behaviour in terms of the response of a system to disturbances with respect to its goals and hinted at the need to develop responsiveness measures to compare different responses to the same disturbance. Kritchanhai & MacCarthy (1999) look at the responsiveness of the order fulfilment process. They suggest three themes for responsiveness that include 1) the events or influencing factors

to which an organisation has to respond; 2) the ability to react and to predict events in order to manage control and take advantage; and 3) the approaches to achieve responsiveness. Their review of literature found that works in the field are around factors that drive a system to be responsive; methods to achieve responsiveness; & benefits of responsiveness. Thus it supports the gap that whilst the benefits and needs for responsiveness are understood, there is a gap in terms of the ability to react & predict events in order to manage, control and take advantage. They present a generic framework for responsiveness based on four components that are *awareness*, *stimuli*, *goals* and *capability*. Holweg (2005) challenges the suggestion that any one approach can be applied universally and rather proposes a balanced generic model based on volume, product and process factors. To Holweg, flexibility is the ability to adapt to internal and /or external influences and responsiveness is the ability of the manufacturing system or the organisation to respond to customer requests in the marketplace. To achieve responsiveness, he suggests that certain types of flexibility are required of the manufacturing system itself, as well as of the supply and logistics subsystems, whilst these types of flexibility are contingent upon the structure and environment of the system. From this perspective Holweg's holistic approach is based on the underlying concept of flexibility in manufacturing and the ability to respond to demand variability or configuration point of a product. He describes three dimensions of responsiveness of product (impact of product variety and customisation), process (the production and supply chain lead times as well as positioning of the decoupling points in the system) and volume (customer expectations and demand). These key factors he believes can help determine which strategy is appropriate and why. Holweg's 'dimensions' however do not really represent responsiveness in its full sense. Process, product and volume factors are useful for decision making on what operational capabilities to employ but there are other aspects to responsiveness such as aligning production control methods to business drivers (Little et al., 2001) and the impacts these have on other entities within the supply chain.

The above authors have looked at responsiveness from different aspects of manufacturing. Interestingly, most of them take a systems approach to responsiveness and recognise the need for the production system to thrive in a competitive environment as part of a supply chain without necessarily addressing its coordination with its supply

chain. Most also take the approach of firstly identifying a stimuli or disturbance (i.e. events or influencing factors to which the company has to respond) (Matson and McFarlane, 1999; Kritchanchai and MacCarthy, 1999), recognising particular ways in it affects the goal of the system, then respond to it after the disturbance or in anticipation. None of these approaches touch the design aspect of a system which is to design a system to be responsive rather they seem to be dealing with issues as they occur and are more reactive. All of them though emphasise or hint at the importance of performance monitoring aspect of responsiveness. Although extending these views from manufacturing to supply chain is a gap (Holweg, 2005), the underlying notions of responsiveness and factors surrounding it are not lost from perspectives in literature that are scoped around supply chains. The next sets of authors take a supply chain perspective.

Fisher (1997) is often credited for introducing the concept of designing a supply chain to meet the demand types of a product. He identifies the root cause of supply chain problems to be the mismatch between product type and the type of supply chain. By characterising products into two types (functional or innovative), he proposes two types of supply chain design (physically efficient or market responsive) that each product type falls into. This has chiefly been the basis for latter works (Chopra and Meindl, 2001; Randall et al, 2003) on responsiveness in the field of supply chain management. In this field the responsiveness construct is almost always synonymous with agility and a responsive supply chain is often considered to be one whose objective is to respond quickly to unpredictable demand in order to minimise stock outs and obsolescence with emphasis on speed, flexibility and innovative products with high margins.

This construct of responsiveness is a basis for Catalan & Kotzab's (2003) model for assessing the responsiveness of a supply chain of which they see demand transparency and time effective flow of goods & information as key factors that enable the right amount of goods to reach their destinations without build ups in inventory. Thus they propose that key responsiveness indicators are lead-time, postponement, bullwhip effect and information exchange.

Daughterty et al (1995) suggest that organisations need to respond to the pace of the situation and not the organisation's planning ritual. They propose three means of enhancing responsiveness which they say will be most effective and these are: 1)

flattening organisational structures to bring decision making closer to customer, promoting internal closeness to speed up decision making for the purposes of adaptability and flexibility. 2) Outsourcing key tasks as using external resources can improve a firm's ability to be responsive by increasing its flexibility to changing market needs. 3) Sharing information with one another as of which they consider most critical to creating responsiveness as it improves customer relations, builds greater loyalty and allows to respond to their requests. They explore the relationship between information sharing and corporate responsiveness; and responsiveness and a firm's operating performance. They found that information availability and responsiveness are positively related and that responsiveness was associated with better operating performance. They conclude that corporate responsiveness has important implications for the long-term profitability of companies and that exposure to information offers the means to create responsiveness.

Harrison (1996) looks at the capability of suppliers to be responsive in a lean environment and argues that leanness and responsiveness are difficult to achieve concurrently when demand is high. He highlights the critical dependency of a supplier on its customer's production, planning & control methods.

Christopher (1998) describes responsiveness as something that increases when supply chain members cooperate and build close relationships.

An alternative view by Emberson & Godsell (2003) is that organisations can be customer responsive or customer influencing, while Frey (1988) introduces a broader perspective of market conditions than just the customer but limits the scope of the application of responsiveness to a department within a firm.

Table 4-2: Definitions of responsiveness

Authors	Definition
(Daugherty et al, 1995)	<i>Responsiveness involves reacting to or even anticipating what customers want.</i>
Barclay, 1996 (Kritchanchai and MacCarthy, 1999)	<i>Responsiveness is the ability to react purposefully and within appropriate timescale to significant events, opportunities for threats (especially from the external environment) to bring about or maintain competitive advantage.</i>
(Gindy and Saad, 1998)	<i>Manufacturing responsiveness is the ability of a manufacturing system to make a rapid and balanced response to predictable and unpredictable demands of the manufacturing environment.</i>
(Matson and McFarlane, 1999)	<i>Production responsiveness is the ability of a production system to achieve its goals in the presence of supplier, internal and customer disturbances where disturbances are those sources of change which occur independently of the system's intentions.</i>
(Catalan and Kotzab, 2003)	<i>The ability to respond and adapt time-effectively based on the ability to read and understand actual market signals in real-time backwards the chain according to changes in end-user demand.</i>
(Grant, Halldorsson, Kotzab, and Teller, 2003)	<i>Responsiveness is defined as the organisations ability to understand & fulfil a customer's need in a timely and favourable fashion, suggesting but not necessarily implying an agile supply chain.</i>
(Emberson and Godsell, 2003)	<i>Customer responsiveness is the identification and delivery of an appropriate supply chain strategy to meet the needs of the market that it serves.</i>
(Shaw et al, 2003)	<i>Responsiveness is the ability of an organisation to react to unforeseen disturbances using a series of capabilities.</i>
Holweg (2005)	<i>Responsiveness is the ability to react purposefully and within an appropriate time-scale to customer demand or changes in the marketplace, to bring about or maintain competitive advantage.</i>

Frey also highlights the need for a set of performance measures as a tool to help managers identify actions needed to provide customers with what they need placing a different emphasis on the measurement aspect of responsiveness.

Literature on time-based competition describes responsiveness as part of the output from implementing a time-based approach (Stalk, 1988; Stalk and Hout, 1990; Anzzone et al., 1991). There are other terms, such as 'Quick Response (QR)' Lawson et al. 1999 and 'Efficient consumer response' that have been conceptualised as responsiveness but these relate to particular industrial sectors of apparel & textiles and food retail respectively.

Table 4-3 summarises the contributions to responsiveness from literature. Overall the literature reveals two perspectives of which responsiveness can be viewed:

- 1) as a concept and
- 2) as a measure

It indicates that the scope of responsiveness spans across functions internal and external to an organisation. It further indicates there are attributes to responsiveness and that are yet to be fully defined. Although hinted at the managerial and behavioural aspects of being responsive have been neglected from these approaches.

In spite of the differences in perspectives of responsiveness, some commonality can be derived from the definitions as a result of the following words:

Ability - this implies that responsiveness requires an action and capability.

Time-effective/ Rapid/ prompt / Timescale / timely - responsiveness is in some way time sensitive and has a time dimension.

Purposefully and favourably – the action taken is in some way pre-empted, pre-planned and preconceived to maximise the potential value that can be appropriated from the situation.

Willingness – this indicates that responsiveness has some flexibility attributes.

Predictable and unpredictable change/ disturbance / stimuli – responsiveness is a reaction but it does not have to only be reactive as it has a proactive component.

Customer / market conditions – implies that the change or disturbance is really to do with environmental factors that impact demand patterns, hence an organisation/ supply

chain's ability to fulfil that demand or future demand whilst maximising appropriated value.

Table 4-3: Contributions to the responsiveness construct

Authors	Contribution	Approach	Scope
Shaw et al, 2003	<ul style="list-style-type: none"> ▪ Responsiveness assessment process 	Systems approach	Manufacturing systems
Matson & McFarlane	<ul style="list-style-type: none"> ▪ Disturbance responsiveness assessment ▪ Factors influencing manufacturing responsiveness 	Systems approach	Manufacturing systems
Kritchanchai & MaCarthy	<ul style="list-style-type: none"> ▪ Generic framework for responsiveness 	Systems approach	Order fulfilment process
Catalan & Kotzab, 2003	<ul style="list-style-type: none"> ▪ Responsiveness assessment model ▪ Factors influencing manufacturing responsiveness 	Causal approach	Supply chain
Daugherty et al, 1994	<ul style="list-style-type: none"> ▪ Factors influencing responsiveness 	Empirical approach	Supply chain
Little et al, 2001	<ul style="list-style-type: none"> ▪ Factors influencing responsiveness 	Reference modelling	Planning systems
Holweg, 2005	<ul style="list-style-type: none"> ▪ Decision making factors for being responsive 	Empirical approach	Manufacturing systems

Defining responsiveness as above means that there are aspects of it that are indicated in agile, lean and other operational paradigms. This supports a proposal that operational paradigms should be viewed as a form of response. Further it indicates that responsiveness needs to be well managed for organisations to meet their goals and that

it should be the key performance indicator for evaluating how well a formulated strategy works to achieve the goals of an organisation/ supply chain. Thus from the deconstruction, three attributes of responsiveness can be derived and they are:

- 1) **Strategic attribute** – being responsive will require the ability to anticipate, formulate and execute strategies to deal with the changes occurring in the marketplace. In other words, strategic alignment is an important feature of the responsiveness of an organisation or supply chain.
- 2) **Infrastructure attribute** – in order to achieve such strategy execution, the infrastructure of the company or supply chain has to be such that it supports the strategy deployment process. This means having the operational capability, processes, structure and resources required to enable the response to take place. So it hints at technical, process, structural and behavioural alignment that are primarily determined by the operational paradigm in use.
- 3) **Control attribute** – the timeliness in which strategic and infrastructure attributes are actualised determines whether or not an organisation/ supply chain has optimised appropriated value. Correspondingly this implicates a performance management feature.

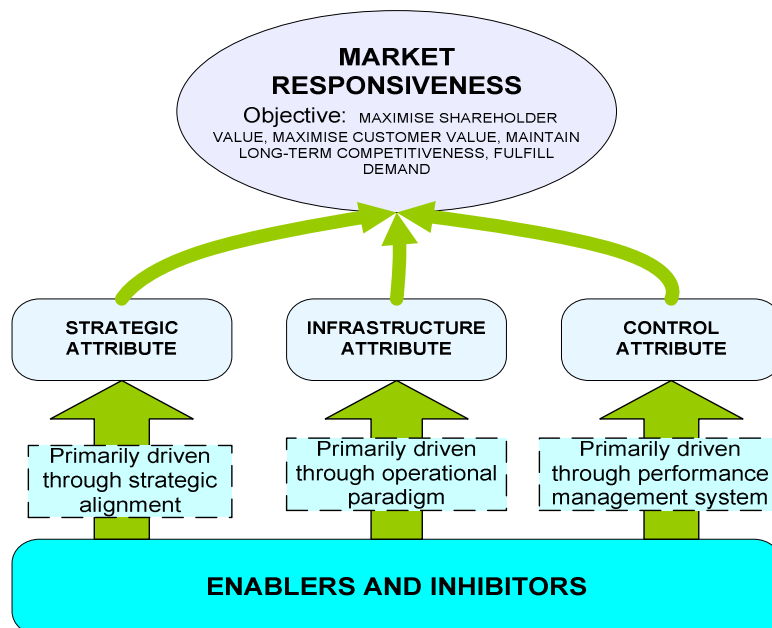


Figure 4-2: Attributes of market responsiveness

Figure 4-2 depicts the attributes of responsiveness. For an organisation or supply chain to obtain its goals and be competitive, all three attributes have to work harmoniously together in respect of that goal. It is for this reason that the systematic literature review was scoped in the manner depicted on **Figure 4-1**, so that it also complements the literature from **CHAPTER 2**. Subsequently by understanding these attributes and the factors associated with them, an organisation or supply chain may adopt whatever means, strategy, operational paradigms or tools that are cost-effective in achieving an appropriate response.

4.3. Competitive Advantage, Strategic Alignment and Performance Management

Most would agree that for-profit companies are in business to make money and increase value to their shareholders. They do so by satisfying their customers more than their competitors so that they survive long-term. Porter (1985) describes this ability to create and sustain superior performance over competition as competitive advantage. Since the launch of ‘shareholder value creation’ idea, there have been some ongoing debates about the primary objective of an organisation. Some have argued that organisations are in business primarily to maximise shareholder value (Cornelius and Davies, 1997; Rappaport, 1987) and can do so over a long term, hence maintaining competitiveness, by also delivering customer value. While others have argued that customer value comes first as a business is more likely to achieve its goals when it organises itself to meet the current and potential needs of customers more effectively than their competitors (Doyle, 1994; Drucker, 2001; Copulsky, 1991; Laitamaki and Kordupleski, 1997). An alternative view is that organisations need to be able to balance between the two (Feurer and Chaharbaghi, 1994; Cleland and Bruno, 1997) as they can be conflicting and can destroy each other. Yet Kennerley & Neely (2000) argue that it is impossible to create shareholder value without creating stakeholder value. Whatever the view organisations need to constantly manage both customer value and shareholder values in order to achieve their goals and maintain long-term competitiveness and since the study is scoped for for-profit organisations it takes a stance that shareholder value is primary, customer value is a means of achieving shareholder value and other stakeholder values

are considered on basis of the magnitude of the impact they have on shareholder value and customer value.

The 'strategic objectives' of an organisation is a key determinant of shareholder value and customer value creation. It defines the competitive strategy of an organisation and embeds all aspects of stakeholder values that an organisation wants to create. However this alone will not lead to long-term competitiveness unless there is consistency between the market priorities that the competitive strategy is designed to satisfy and operational capabilities that the operations strategy aims to build (Chopra and Meindl, 2001).

It has been reasoned from Chapter Two that although operational paradigms influence behaviours and the actual response that a markets gets, they are also a form of strategic response. De Meyer (1992), for example, found that whilst operational paradigms led to massive improvements on shop floors, with waste eliminations and cost-savings, these did not necessarily translate into competitiveness. So an operational paradigm is necessary but not sufficient for an organisation / supply chain to achieve long-term competitiveness. It will need to be aligned with the strategic objectives of the organisation / supply chain for it to deliver optimal value but the influence it exerts over process design, operations structure, work methods, demand-supply etc. make it a key driver of the infrastructure attribute of response. Whilst strategic alignment is a predominant driver of the strategic attribute of responsiveness as it ensures that formulated strategy and its objectives are on the basis of market needs (customer value + other stakeholder values) and organisational expectations (shareholder value + other stakeholder values) and that processes & measures are designed to impact both shareholder and customer value creation.

From a control attribute perspective, most proposals tend to take an isolated approach of proposing shareholder value measures or the use of customer value measures with very few centred on managing both as a means to manage either shareholder value or customer value. According to Melnyk et al.(2004) performance measurement systems are ultimately responsible for the coordinating and maintaining the alignment between strategic goals and metrics as plans are implemented and restated as they move through the tactical and operational stages (Melnyk et al. 2005). The balanced scorecard (Kaplan and Norton, 1992; Kaplan and Norton, 1996) is one such approach that considers both financial and customer measures. However it has not aligned them in a

manner that considers the management of performance within an inter-organisational context. Kennerley & Neeley (2000) suggest a stakeholder centric view of performance measurement systems via the '*performance prism*' that is more aligned to different stakeholder needs. This however is also focused on intra-organisational use. A supply chain model is a particular need as the supply chain management is about delivering value to the customer (Christopher, 1998) in an efficient manner that will also deliver shareholder value (Christopher and Ryals, 1999). The value gaps model (**Figure 4-6**) proposed in this thesis, illustrates areas within an organisation and a supply chain where values is potentially created, maintained or lost during strategy execution. So whilst operational paradigms may evolve into new approaches for managing certain types of demand, their impact on competitiveness lies not only in an organisation / supply chain's ability to implement them successfully but also on their alignment with the strategic and control attributes of organisation / supply chain's response.

4.3.1. Strategic Alignment: Strategy Flow and the Value Gaps Model

Lee (2004) describes the objective of alignment as creating incentives for better performance. Gattorna et al. (1998) describes it as the appropriateness of the following four elements of the market, the organisation's strategy, the organisation's culture and the leadership style relative to one another. Lockamy and Smith's (1997) model of alignment is congruency between strategy, processes and customers. They argue that such an alignment is essential to ensure that strategy objectives are driven by customer needs and expectations but have neglected the impact of shareholder influence on strategic objectives. Powell (1992) found that organisational alignment can maximise shareholder value and hence create sustainable competitive advantage. Lee's description is geared towards behavioural change and Gattorna's is linking the internal capabilities of the organisation towards its external environment. Strategic alignment is often seen, by authors, from an internal perspective of aligning core processes of a business with its strategic objectives. However business processes often cross functional lines and lie outside of established management systems (Lockamy and Smith, 1997) such that strategic alignment does not only apply to the internal organisation and the market place but also to other external partners and suppliers.

Inter-organisationally, strategic alignment can facilitate the relationship between organisations as they cooperate to produce more value (or at a lower cost) than is possible in a supply chain Christopher (1998). Therefore alignment within the context of this research is looking at consistency between business strategy and functional strategy and its deployment to operations to drive the desired business processes, behaviours and metrics that will enable ultimate satisfaction to relevant stakeholders in the market place. For this reason it is suggested that it takes the following forms:

- Intra-organisational -Top-down / Bottom-up alignment that is the consistency between business strategy, functional strategy and operational strategy.
- Intra-organisational -Functional alignment that is the consistency between business processes that run across functions relative to the business strategy.
- Inter-organisational -Supply chain alignment that is consistency between business strategy, supply chain strategy and processes across the supply chain.

Table 4-4 provides a list of why alignment is important for being responsive.

Table 4-4: Alignment and responsiveness

Why alignment enables responsiveness
▪ Facilitates a closer working relationship
▪ All functions are working towards the same goal
▪ Enables optimal organisation design
▪ Ensures strategic fit
▪ Negates sub-optimal behaviours
▪ Individual targets are realistic and encourages cooperation
▪ Creating added customer value
▪ Improving customer retention
▪ Enables business growth
▪ May create scale economies within an inter-organisational context
▪ Gives the organisation a better chance to win more of the customers business

Fisher (1997) suggests that the root cause of waste in the supply chains is the misalignment of supply and product strategies and that realigning them would create remarkable competitive advantage that generates high growth in sales and profits. A

strategic fit between supply chain and product is required and competitive advantage can be further enhanced through segmenting the market to appropriate the right supply chain (Christopher and Towill, 2002) and competitor moves (Ohmae, 1982; Porter, 1980). Skinner (1969) identifies manufacturing strategy as the missing link in corporate strategy building process. Other authors (Hayes and Wheelwright, 1979a; Swamidass et al. 2001; St. John and Rue, 1991; Bennett et al., 1992; Walters, 1999; Weir et al., 2000) have further added to this notion that there are necessary links between marketing strategy and manufacturing/ operations strategy. The strategy flow diagram on **Figure 4-3** proposes different levels of strategic decisions that an organisation needs to align in order to determine the appropriate response for a particular market segment. It describes the interdependencies and the flow that should exist between the different levels of strategic decisions. The business strategy should embed the marketing strategy which drives the supply chain strategy which further drives the manufacturing strategy and the product strategy. At each stage of the process there is a feedback loop to ensure that the desired responsive attributes can be met.

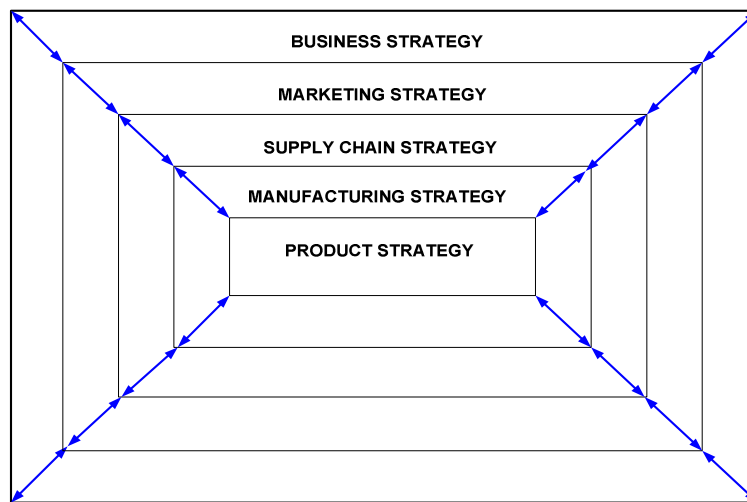


Figure 4-3: Strategy flow diagram

4.3.1.1. Business Strategy Level

At the business strategy level an organisation defines its mission, goals, growth targets, return on investment, profitability targets, cash generation. At this point all stakeholder needs are taken into consideration and each stakeholder value is defined. It is proposed

that whilst all stakeholders are important, their level of importance is determined by the impact they are likely to have on creating/ enhancing shareholder value and customer value. This way the competitive strategy decisions on how the business wishes to compete in its markets are determined on the basis of the organisation being able to meet its strategic goals of satisfying primarily shareholder value and customer value. These and all the stakeholder needs are put into strategic objectives.

4.3.1.2. Marketing Strategy Level

The primary purpose of a marketing strategy is to allocate resources to the choicest opportunities to maximise revenues and achieve a sustainable competitive advantage by differentiating from competitors (Christopher and McDonald, 1995). It is most effective when it is an intrinsic part of the business strategy (Slack et al., 2001) culminating the goals and policies of the organisation into a robust strategy that identifies how the organisation will engage with customers, its future prospects with respect to the competition and other environmental factors. Whilst aspects of the marketing strategy constitutes making decisions around the popular four Ps (Product strategy, Pricing strategy, Promotion strategy, Placement/distribution strategy) variables, market segmentation & positioning are the cornerstones of marketing management (Firat and Shultz, 1997). Porter's (1980) generic strategies of cost leadership, differentiation and focus have often been used as a traditional basis for segmentation. This was further enhanced by Treacy & Wiersema's (1993) value disciplines of which they identify customer preferences that go with each value discipline. Both works take the stance that market segmentation is an alternative to product differentiation; adding also to the confusion in terminology that exists between product differentiation and market segmentation (Dickson and Ginter, 1987). Over the years it has been found that traditional conceptions of segmentation and positioning are no longer satisfactory (Firat and Shultz, 1997; Christopher and McDonald, 1995; Yankelovich and Meer, 2006; Dickson and Ginter, 1987) and that these approaches alone to segmentation does not reflect buying behaviour. A criteria for viable market segmentation by Christopher & McDonald (1995) constitutes firstly that the variable chosen for the segment must be identifiable and measurable; secondly the basis of segmentation must be relevant to the purchase of the product and must be related to buyer behaviour; thirdly the segment must have sufficient potential size to ensure

adequate return on any marketing investment made; and finally, the segment has to be accessible through available marketing channels. Although Treacy & Wiersema (1993) acknowledge, in their work, that the same customers can be found in all three categories depending on what they are buying yet the same customer can exhibit different buying behaviour for the same product depending on the urgency of their need. Fisher (1997) also in his distinction acknowledges that a product can be functional and innovative using same processes, same factories and same supply chain. This makes buying behaviour an important distinctive quality when segmenting customers as it determines the level of demand predictability and variation that is to be expected within an organisation or a supply chain which in turn impacts on the response that can be provided as a result. Segmenting in this manner allows the altering of the functional relationship between perceived product characteristics and demand such that product differentiation complements the segmentation whilst physical and non-physical modifications can be made at ideal points to the entire market or a particular segment (Dickson and Ginter, 1987). This means that organisations can maximise shareholder value & customer value by developing appropriate customer segments according to demand characteristics.

4.3.1.3. Supply Chain Strategy Level

Supply chain strategy involves the structuring and design of the supply chain such that there is synchronisation between the activities of the various functions involved in production of the product including suppliers and customers (**Figure 4-6**). Therefore it can offset the tension between revenue growth focused targets of marketing and the cost reduction focused targets of manufacturing; the trade off between flexibility and cost efficiency; that appears to be the major source of strategic incompatibility between the two parties (De Meyer et al., 1989; Swamidass et al. 2001). Supply chains can have multiple configurations and as a result of identified segments, decisions around make or buy, location of facilities such as manufacturing operations and their capacities, warehousing, network distribution, sourcing strategy, service and operating policies/paradigms need to be made at this level to ensure that the maximum value can be delivered to both shareholders and customers for each segment. However the existing configuration of the supply chain of an organisation establishes constraints within which planning for each of its segments must be done and as such, Christopher & Towill

(2001) suggest that one solution does not fit all (Shewchuck, 1998) but rather, context specific hybrid strategies are required. Gattorna & Walters (1996) describe four distinctive characteristics of customers at stages of the product life cycle. Although their alignment model is focused on linking competitive positioning with business strategy, organisation culture and leadership, it also assumes a differentiated approach to satisfying each segment. Current hybrid strategies involve the mix of lean and agile patterns: Fisher's matrix (1997) linking product characteristics with supply chain characteristics implies that an organisation can have two different supply chains to represent lean and agile strategies as it is likely to have both product types. Naylor et al's (1999) *Leagility* advocates the combination of Lean and Agile strategies within a supply chain via the strategic use of a customer order decoupling point; Mason-Jones et al. (2000) define market-winners/ market qualifiers matrix for the use of agile / lean; Christopher & Towill (2001) suggest using pareto analysis 80/20 to determine appropriate paradigm to employ; Christopher & Towill (2002) implicate the use of leanness and agility in the same supply chain by separating base and surge demands (**Figure 4-4**). They also further Christopher's matrix (1998) by adding lead time characteristics to the existing product type and demand type characteristics identifying lean and agile responses accordingly.

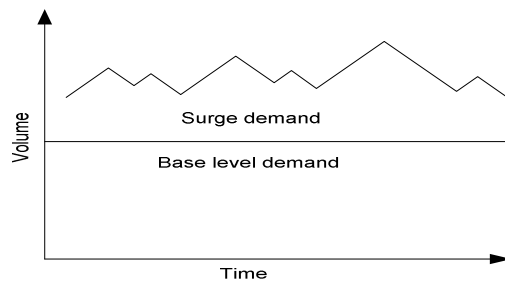


Figure 4-4: Base surge demand, after Christopher & Towill, 2002

So it appears that a differentiated supply chain strategy is required as, depending on the differentiating variable, the supply chain of most organisations tend to exhibit the need to respond using both leanness and agility. This has implications for the manufacturing method employed as it has to have the capability to respond to the requirements of its supply chain.

4.3.1.4. Manufacturing Strategy Level

Skinner (1969) is credited for introducing manufacturing strategy as a competitive weapon that needs to be built into the corporate strategy; recognising that different marketing strategies place different demands on a manufacturing system hence the need to tailor manufacturing to meet specific segments (Skinner, 1974). Hayes & Wheelwright (1979b; 1979b) build on this by matching product structures with process structures thus not only introducing the concept that manufacturing processes ought to change as a product moves through the stages of its lifecycle but also expanding competitive strategic options available to managers via the separation of product and process lifecycles. Their product-process matrix reflects the coordination that needs to occur between product-marketing and manufacturing meaning that competitive advantage is gained through process competence. However Hayes & Wheelwright (1979a) appear to use product and market interchangeably and this may not fully embrace the complexities of modern manufacturing systems. These complexities are in the form of demand patterns discussed in the previous section - the same product can exhibit different demand patterns yet same customer can exhibit different buying behaviour for a particular product. Christopher (1998) argues that customers do not buy products but '*benefits*' i.e. a product is purchased not for itself but for the promise of what it will deliver. He suggests that different groups of customers attach different importance to different benefits that can be addressed through value segments. Hill's (Hill, 1993) advancement on Hayes & Wheelwright addresses these '*benefits*' better as it matches process choice, on the basis of volume, order qualifying criteria and order winning criteria, with product-market evolution meaning that competitive priorities shift as a product matures. Yet De Meyer et al. (1989) shows that there is a tendency to stabilise competitive priorities whilst market changes that hints at management inertia and mismatch between demand and supply. Their survey found that manufacturing priorities are not that easily changed and that competitive priorities do not have to be the reflection of existing strengths as they also found less consistency between stated priorities and concerns and action plans on the other. So whilst this is true, manufacturing strategy should be embedded within the supply chain strategy as manufacturing has to synchronise with the design of the supply chain

of an organisation that is already aligned with a value segment. This way the flow of the product matches its demand.

Make or buy decisions need to be pulled into the supply chain strategy level as it affects the design of both the supply chain and manufacturing. Daugherty et al (1995) for instance suggest outsourcing capital intensive or complex technological activities can help a firm to become more flexible in adapting its practices to meet market changes that occur as a result of competition, customer needs or the economy especially when readily available externally. This catalogue of design characteristics, decision variables available for the design of the manufacturing system helps to determine the choice of operational paradigm to employ and at which stage of the supply chain to help meet market. However as already indicated the nature of the product has to match these decisions at all levels if the organisation is to maximise the value it can appropriate especially as the shortening of product lifecycles and increasing market/demand fluctuations changes the variety of products, design and volume fluctuations (De Meyer et al, 1989).

4.3.1.5. Product Strategy Level

This involves the product planning, product marketing of a particular product range at all stages of the lifecycle. It defines the product functionality for the user and value for the buyer such that it is differentiated from the competition. It also defines how the life of a product (see **Figure 4-5**) has to be managed with respect to business costs and sales measures through its development to end of life and its design for manufacture.

Fisher's (1997) extension of Hayes & Wheelwright's matrix links the nature of demand for products (demand predictability, product variety, and market standards for lead times and service) with the appropriate supply chain that can best satisfy that demand. He suggests that by classifying products on the basis of their demand patterns they will fall into one of two categories i.e. primarily functional (do not change much over time, stable predictable demands, long life cycles, low profit margins) or primarily innovative (higher profit margins, high unpredictability of demand, short life cycles, high variety) advocating that each category requires a distinctly different kind of supply chain thus giving birth to the idea of differentiated supply chains. His finding infers two types of 'benefits' but Treacy & Wiersema (1993) identified a third type: the hybrid demand type of customer intimacy. This is because an organisation may lean towards mass

customisation or a more customised project-based approach to fulfil this type of demand. Treacy & Wiersema's (1993) approach touches on behavioural demand patterns whilst Fisher's uses product patterns highlighting a gap in research in terms of identifying the most appropriate classification variable or unit of analysis to use when an organisation or a supply chain wants to respond to its market to optimise shareholder value and customer value.

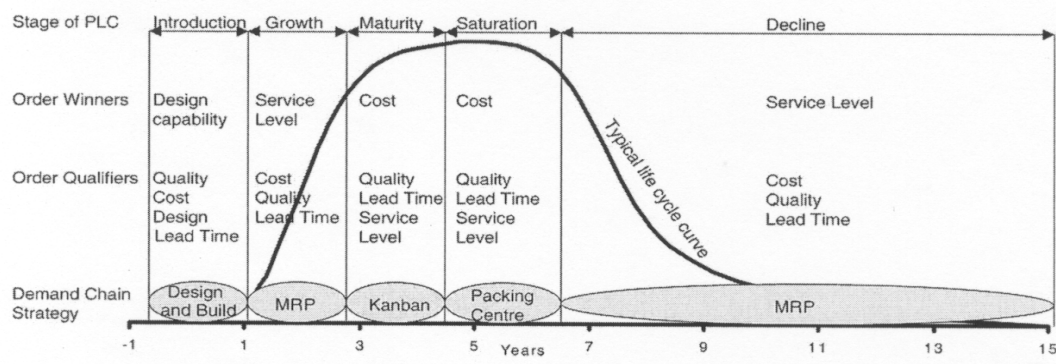


Figure 4-5: Changing customer values Childerhouse et al (2002)

The strategy flow model has shown some of the interdependencies that exist between various types of strategic decisions that take place within an organisation and indicates the importance of having these decisions aligned. Although the flow has been discussed from business strategy to product strategy it is not intended to imply that one is more important than the other or that certain strategies should be at a higher level than the other; rather it can be counter-argued that considering that direction of the arrows product strategy is central to all strategy (especially based on the scope of this research **CHAPTER 1**). A generic theme that has emerged from this strategy flow review is that each level of strategy formulation is an opportunity for the organisation to create or at least maintain competitive advantage (denoted by the green line on **Figure 4-6**). The value gaps model proposed on **Figure 4-6** illustrates areas within an organisation and a supply chain where potentially value is created, maintained or lost during strategy execution. To create value, these aspects of strategy must agree on what it is, share information and resources to achieve it, and then share the benefits. However the issue with each of these levels is the distinguishing of an appropriate unit of analysis. This is important as such distinctions need to align and not conflict in order for the organisation to be successful at this. So while all works seem to point towards differentiation; and

all works agree that demand characteristics change as a product moves through its lifecycle so the supply chain has to be changed to match, the variables are contestable. Childerhouse et al.(2002) highlight a number of classification variables for the matching of supply with demand arguing that the order winner and order qualifier variables are the most dynamic as the product goes through its life cycle (**Figure 4-5**). Fisher's matching of product with supply structure implies that there are only two different types of supply chain design - Lean or Agile (Childerhouse and Towill, 2000), whilst Gattorna & Walters (1998) hints at multiple product segments each with a differentiated strategy. Childerhouse et al. (2002) argue that no single supply chain strategy is applicable to all product types but rather supply chains should be engineered to match customer requirements yet a customer may buy multiple products from the same company and may exhibit different buying behaviours for each. This tension identified from the review interestingly shows that literature on manufacturing operations (and traditionally so) have tended towards differentiating operations through a product lens; literature on marketing have tended towards customer value segments that are predominantly based on customer buying behaviours; while supply chain literature is predominantly focused on separating lean and agile demand patterns as a means to respond. Which is most appropriate?

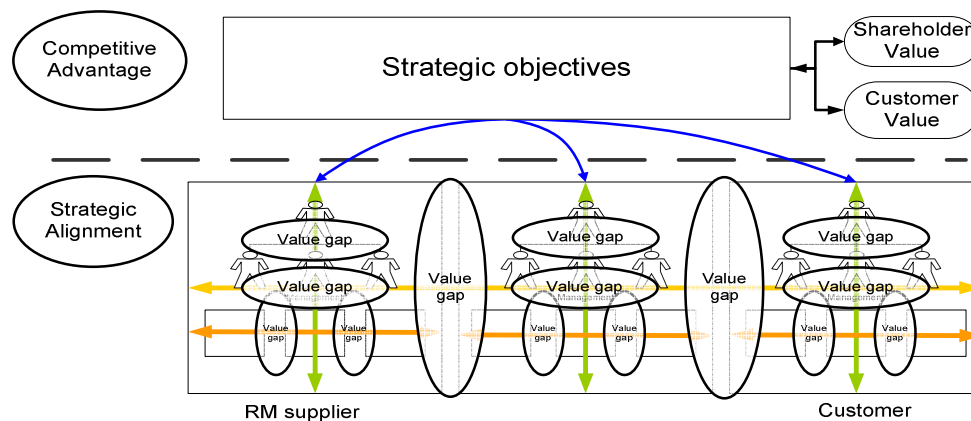


Figure 4-6: Value Gaps model

Such a factor has to be agreed internally for cross-functional alignment (denoted by the orange line on **Figure 4-6**) to take place. The ongoing alignment of organisation priorities and resources, which requires the connection described by the strategy flow at those relevant levels, is also required inter-organisationally. As changes in the market

such as demand, technology and legislation may evolve the industry and force them away from meeting each other's needs (Porter, 1980). To add to this value can be maximised at each customer/supplier interface, reflecting the need for resources, structure, and practices that are unique for each value segment.

The responsive challenge posed by strategic alignment is the cooperation of business entities within a supply chain to change organisational and employee behaviour in line with the dynamics of the market place (Robson, 2004) and creating incentives for better performance (Lee, 2004) giving a supply chain the capability to be market responsive and also competitive.

From **Figure 4-6** it can be seen that although customer value and or shareholder value may be the primary aim, the stakeholders are different at each value gap and from a control attribute perspective, a performance management model that tries to align all these stakeholder groups to meet this aim is a requirement. This is because, within a business unit, customer and shareholder values can be defined and translated into strategic objectives. These strategic objectives can then be cascaded through the organisation with the aim of aligning all the functions, processes and systems to be able to meet the set goals. Hence the strategy deployment process is a value translation and a value execution process. The ability to manage these value gaps during the value translation and execution process can consequently lead to alignment or misalignment. These interfaces where value gaps exist are referred to as fragmented areas that form the organisation / supply chain and include: the consistency between hierarchical levels of what these values are or mean in terms of execution at each level; the consistency between functional roles of how these functions perceive their role in delivering the values right down to the individuals and; the consistency between organisations within a supply chain context of what these values are or mean to their individual organisations and their role in delivering 'value' in their supply chains. So whilst interdependencies exist between shareholder value and customer value (Cleland and Bruno, 1997), it can be argued that a proxy for shareholder alignment would be the strategy deployment process (Rappaport, 1987) and the proxy for alignment with customers would be both the internal and external demand-supply chain processes (Walters and Rainbird, 2004).

4.3.2. Enablers and Inhibitors

Powell (1992) states that, *'by focusing on industry and competitive strategy variables, contemporary industrial organisation and strategy research has understated the role of organisational factors in producing sustainable competitive advantage.'* For a company to be responsive it needs to have awareness of each of its segments by having close contact with customers to know what that market wants in terms of new design/innovation; level of customisation; lower costs; better quality of service / products; product flexibility (volume /range); and delivery (when and where they want the product). Balancing these needs require certain factors to be managed and since market needs are constantly changing some of these factors are generic factors that need to be considered in any change process. A wide range of enablers and inhibitors were identified from the literature review (**Table 4-5**) and after much analysis, they have been summarised under the four key factors expanded upon below.

1) Understanding and identifying appropriate customer segments: Organisations these days tend to have multiple product segments and customer segments, each with different characteristics. In attempts to maximise profitability (or value to shareholders), they constantly seek ways to increase efficiency of processes by sharing resources across multiple value segments. Using the wrong segmentation approach inhibits responsiveness as potentially inappropriate processes or approaches can be used a particular segment. To manage this, an organisation / supply chain will need to balance between efficiency and differentiation (Chopra and Meindl, 2001). It is therefore likely that an organisation can set up an independent supply chain for each different product or customer segment but is only feasible if a segment is large enough to support a dedicated supply chain (Christopher, 1998; Chopra and Meindl, 2001; Gattorna et al., 1998). This applies to using appropriate units of analysis for the supply chain when implementing the BPMS as targets may vary according to segment needs.

2) Fragmentation of supply chain ownership: Organisations have become less vertically integrated and have shed non-core functions in order to take advantage of supplier and customer competencies that they did not have (Christopher, 2005; Hagel and Singer, 1999). This new ownership structure has broken the supply chain into many owners each with its own policies and interests, making the supply chain more difficult

to coordinate. Each owner working on its own objectives risks the reduction of supply chain profitability (Chopra and Meindl, 2001). In addition fragmentation leads to narrow focus, sub-optimisation, conflicting goals (loss in strategic purpose) and loss in interaction (communication and information sharing). It also increases uncertainty and leads to inappropriate target setting. Yet lack of fragmentation also means no accountability. Within a supply chain context there are different types of fragmentation and these include: hierarchical structure, functional departments/ labels, individuals, organisations (within a supply chain), process disconnects, facility layout and financial structures (e.g. cost centres). To overcome the barriers of fragmentation it is suggested that areas of negative behaviour due to fragmented ownership are identified and set new ownership / roles & responsibilities / organisational structure or take a process view to target setting. Thus the negative impact of target setting and fragmentation in meeting supply chain objectives can be minimised by taking a broader scope (or process view) and by minimising loss in competitive advantage by recognising 'value' at each interface. By getting representatives from organisations, hierarchical structures, functional departments and individual roles to work together within their areas of interface to identify what is 'value' to each of the parties and the ultimate stakeholders, a more aligned working relationship can be established. This hints that integrative metrics that span the supply chain will be useful as both parties may contribute the data required for input to an agreed BPMS of which they can prioritise accordingly.

3) *Performance measurement*: Performance measurement can be an enabler or inhibitor depending on its components, how it is implemented and used. This can be an inhibitor when it is irrelevant to organisational goals and strategic objectives (Schmenner and Vollmann, 1994) as activities are focused on improving results that are not part of organisational objectives (O'mara et al., 1998). It can also inhibit in an environment where there is a fear of being measured, a blame culture and a mindset that uncovering problems is 'bad'. Furthermore in a situation where there is a lack of understanding or lack of training or highly complex measures, decisions that are not aligned with strategy are made. A key aspect of performance measurement is target setting as it is directly linked with behaviours. This is because the performance measurement process is an execution of strategic intent and strategic intent is a target setting exercise. Inappropriate target setting, like fragmentation of financial structures

into responsibility centres (Otley in (Neely, 2002)), can also lead to narrow focus, sub-optimisation and conflicting goals. Inappropriate target setting means that employees are provided incentives to improve certain measures without taking a broader scope such that it leads to 'cheat' in system rather than real 'improvements' and eventually creates tension between business entities. Storey et al. (2005), for example, found that SMART (Specific, Measurable, Achievable, Realistic and Timely) targets and the desire for individual accountability have contributed to functional sub-optimisation. Thus they propose that effective performance measurement needs to balance the requirements of the individual with the requirements of the organisation and wider supply chain. This hints towards more general measures over which the individual has no direct control (Robson, 2004). Measurement can be used as an effective integrative tool and performance measurement systems are ultimately responsible for the coordinating and maintaining the alignment between strategic goals and metrics as plans are implemented and restated as they move through the tactical and operational stages (Melnik et al. 2005; Melnik et al, 2004; Fawcett and Cooper, 2001).

4) *Demand uncertainty*: Companies these days need to provide more just to maintain business as customers have become more sophisticated and as such increasingly demanding (Pil and Holweg, 2004; Chopra and Meindl, 2001; Lowson et al, 1999). This means that market segments have become increasingly fragmented as customers demand more custom-made products to suit their needs. This in turn makes forecasting and meeting demand more difficult. To overcome this, an organisation / supply chain will have to adapt to the manufacture and delivery of new products in addition to coping with shorter lifecycles. Increased variety leads to increased uncertainty that leads to increased cost and in the end decreased responsiveness. Shorter lifecycles means increase uncertainty and decreased window of opportunity within which the supply chain can achieve fit.

Table 4-5: Enablers & inhibitors to responsiveness

Factors	Enabling (☺) / Inhibiting (☹) / Needs managing ☺	Author
<i>Demand uncertainty & variability</i>	☺ Ability to recognise / anticipate demand; ☺ Joint level of planning; ☺ Management of product variety; ☺ Cooperation to develop new products	(Fisher et al., 1994; Randall et al, 2003; Inman and Gonsalvez, 1997; Harrison, 1996; Matson and McFarlane, 1999; Chopra and Meindl, 2001; Pil and Holweg, 2004)
<i>Supply chain flexibility</i>	☺ Buffers; ☺ Inventory levels	(Matson and McFarlane, 1999; Shaw et al, 2003)
<i>Integration of information, functions and organisations</i>	☺ Integration of functions ☺ Integration of information ☺ Integration of organisations ☹ can limit flexibility	(Christopher, 2000; Lee et al., 1997; Bagchi and Skjoett-Larsen, 2003; Pagell, 2004).
<i>Timely flow of goods and information</i>	☺ Lead time compression; ☺ Demand transparency; ☺ Timely information; ☺ Relevant and accurate information; ☺ Open communication; ☺ Commitment to sharing information;	(Catalan and Kotzab, 2003; Stalk and Hout, 1990; Pagell, 2004; Kannan and Tan, 2004; Lee, 2004)
<i>Organisation structure – intra and inter organisational team</i>	☺ Process orientation and work flow structure plus inter-firm ☹ Functional orientation; ☺ Cross functional teams	(Catalan and Kotzab, 2003; Gunasekaran et al., 2004; Robson, 2004)

Factors	Enabling (☺) / Inhibiting (☹) / Needs managing ☹	Author
<i>Management methods</i>	☺ Manufacturing flow – aligned to customer demands; ☺ Production control methods aligned with business drivers; ☺ Synchronisation of management and workforce; ☺ Level of complementary philosophies; ☺ Supportive / participative management; ☺ Leadership; ☹ Coercive power; ☺ Trust	(Little et al, 2001; Pagell, 2004; Kannan and Tan, 2004; Lee, 2004; Gattorna and Walters, 1996; MacMillan et al., 2005)
<i>Culture and attitudes</i>	☹ Internal competition; ☺ Continuous improvement; ☺ Joint terminology; ☺ Cooperative	(Kannan and Tan, 2004)
<i>Shared goals, resources and benefits</i>	☺ Incentives to remain aligned; ☹ individual goals; ☹ Conflicting goals; ☺ Shared risks; ☺ Shared rewards	(Monash & Clinton, 1998; Kannan and Tan, 2004)
<i>Performance measurement</i>	☺ Decision making capability; ☺ Joint problem solving; ☺ Joint level of using performance measures; ☺ Joint targets	(Melnik et al, 2004; Lockamy and Smith, 1997; Kannan and Tan, 2004)
<i>Difficulty in executing new strategies</i>	☹ Strategy formulation; ☺ Decision-making capability; ☺ Stakeholder involvement; ☹ Strategy deployment process	(Morgan, 2004; Chopra and Meindl, 2001; Matson and McFarlane, 1999)
<i>Understanding and identifying appropriate customer segments</i>	☺ Variable identifiable and measurable; ☺ Relevant to purchase of product and buyer behaviour; ☺ Sufficient size for adequate return; ☺ Accessible through available marketing channels	(Christopher, 1998; Gattorna and Walters, 1996; Chopra and Meindl, 2001; Christopher and McDonald, 1995)

4.3.3. Business Performance Management Systems

To manage either shareholder value or customer value, most proposals tend to take an isolated approach of proposing shareholder value measures or the use of customer value measures with very few centred on managing both. It has been highlighted from the previous section that a performance management system that can facilitate closer working relationships; ensure all functions are working towards the same goal; enable optimal organisation and supply chain design; negate sub-optimal behaviours; and ensure individual targets are realistic thus encouraging cooperation will give an organisation a better chance to win more of the customers business.

A dominant perspective of performance measurement is that it is a *process of quantifying the efficiency and the effectiveness of actions* and a performance measurement system is the set of metrics used to quantify both the efficiency and effectiveness of actions (Neely et al., 1995). However Franco-Santos et al. (2004), based on identified 'necessary conditions' they have defined a business performance measurement system as *'the set of processes an organisation uses to manage its strategy implementation, communicate its position and progress, and influence its employees' behaviours and actions'*. They state that *'it requires the identification of strategic objectives, multidimensional performance measures, targets and the development of a supporting infrastructure.'* Further, they identify different management perspectives that include an operations perspective, a strategic control perspective and a management accounting perspective of a business performance measurement system.

Some researchers (Morgan, 2004; Waggoner et al., 1999; Gunasekaran et al., 2001; Holmberg, 2000; Chan et al., 2003) indicate that performance measurement plays a vital role in organisations and supply chains because it can motivate staff and can ensure change in strategy is being matched. Although it cannot change an organisation's culture, it can act as a catalyst for change by identifying what to change and what to change to. It also ensures support of an objective, helps decision making by indicating how well an organisation has performed, where they currently are and where they need to be. Further it is a communication mechanism which encourages teamwork, establishes accountability and priorities. On the other hand researchers such as Storey

et al.(2005) have found from empirical study that current approaches to performance measurement drive functional sub-optimisation by driving the wrong organisational behaviours in supply chains. The impact that performance measurement has on responsiveness has been hinted so far in the research and particularly as it can enable alignment (**Table 4-6**). It can also be designed in a manner that makes it synonymous with the control attribute of responsiveness. Therefore by understanding the underlying mechanisms of performance measurement, it is proposed that control aspect of the model can be designed to enable responsiveness intra-organisationally and inter-organisationally. This will have the benefits of: facilitating closer working relationships; ensuring all functions are working towards the same goal; enabling optimal organisation and supply chain design; negating sub-optimal behaviours; ensuring individual targets are realistic thus encouraging cooperation; giving the organisation a better chance to win more of the customers business; and ultimately enhancing shareholder value.

Table 4-6: How performance management aids alignment

Enabling:	Inhibiting:
<ul style="list-style-type: none"> ▪ Motivating staff ▪ Ensuring change in strategy is being matched ▪ Ensuring support of an objective ▪ Cannot change an organisation's culture but can act as a catalyst for change 	<ul style="list-style-type: none"> ▪ Mindset that uncovering problems is 'bad' ▪ Fear of being measured ▪ Blame culture ▪ Not relating measures to organisational goals / strategic objectives ▪ Lack of understanding/ no training ▪ Too complex measures

4.3.3.1. Performance measurement in supply chains

The use of performance measurement systems in the management of supply chains is a recognised need of which in recent years academic researchers have begun to emphasise more. Despite this, there are still a number of issues related to the many measurement systems frameworks identified for supply chain that prevent businesses from effectively

measuring supply chain performance (Lambert and Pohlen, 2001). From analysis of the literature it was found that not only were existing models too tasking to implement, too complex, too conceptual, too subjective, they were also taking a narrow scope, impractical, predominantly focused on historical data, based on single firm metrics and were not linked with strategy or lacked consideration for behavioural impact (Shaw et al, 2003; Suwignjo, Bititci, and Carrie, 2000; Bititci, Suwignjo, and Carrie, 2001; Robson, 2004; Beamon, 1999; Beamon, 1998; Morgan, 2004; Chan et al, 2003; Chan and Qi, 2003; Chan and Qi, 2002; Toni and Tonchia, 2001; Gunasekaran et al, 2001; Gunasekaran et al, 2004; Lambert and Pohlen, 2001; Kaplan and Norton, 1992; Melnyk et al, 2004; Storey et al, 2005). As a result, the list on **Table 4-7** identifies enabling qualities of a performance measurement system that supports responsiveness in supply chains.

Performance management precedes performance measurement and gives it meaning (Lebas, 1995) yet most literature on performance within supply chains has focused more on performance measurement than performance management. Some recent frameworks that encapsulate some aspect of performance management are summarised in the following paragraphs.

Brewer & Speh (2000) propose an extension of the balanced scorecard for use in supply chains. This links SCM goals, customer benefits, financial benefits and SCM improvement with the balanced scorecard's business process perspective, customer perspective, financial perspective, innovation and learning perspective respectively. The strength of the BSC is that it has helped organisations build shareholder value and customer value into strategic objectives and relate them to a performance system. Although Brewer & Speh's approach is a good way to link supply chain perspective with top management agenda, it appears to take a fragmented approach (for e.g. captures customer benefits rather than involve customers in its reporting process). Godsell et al. (2006) also found that a BSC approach tends to be cascaded down from business objectives to functional objectives thus driving a hybrid approach. The approach could also benefit from empirical testing.

Table 4-7: Qualities of an enabling performance model

Quality	Description
Integrative	Agreed by the users; Same measures shared/ used by all; brings different groups together. -(Fawcett and Cooper, 2001; Chenhall, 2005)
User friendly	The extent to which the users find it easy to use and understand. Applicable in practice with policy for use to ensure proper implementation. (Maskell, 1991)
Enable focus on strategic objectives	Measures, targets and objects of the review should be relevant to strategic objectives such that competitive advantage is tracked.
Provokes appropriate feedback and response	Linkable to individual targets whilst effecting desired behaviours and behavioural changes in organisation/ supply chain.
Timely	Data available when needed; reporting and feedback loop timely enough to allow decision making for continual improvement. - (Wilcox and Bourne, 2003; Franco-Santos et al. 2004)
Balanced measures	A balance between financial and non-financial performance. Enough operational measures that will allow the operations to make effective decisions
Ability to recognise obsolescence	Identify policies that will ensure that metrics are still useful/ can be changed as necessary. - (Neely, 2002; O'mara et al, 1998; Toni and Tonchia, 1996; Maskell, 1991)
Take a broader scope	Does not limit user to a particular task but an overall picture hence its impact.
A series of some generic measures	Recognising relative measures and identifying some basic generic measures that are useful as a starting point for new users to tailor their needs.

Lambert & Pohlen (2001) point to the lack of evidence for the existence of meaningful performance measures that span the supply chain. They argue that factors that contribute to this include: the lack of supply chain orientation, the complexity of

capturing metrics across multiple companies, the unwillingness to share information among companies, and the inability to capture performance by customer, product or supply chain. They also emphasise that a major contributor to the lack of meaningful supply chain performance measures is the absence of an approach for developing and designing such measures. The strength of their approach is that it provides a mechanism for building meaningful supply chain measures that links shareholder value creation and customer value. Though the approach requires empirical testing, it could benefit from being supported by an inter-organisational performance management system.

Gunasekaran et al.'s (2004) framework pulls together metrics associated with plan, source, make and deliver and places them along strategic, tactical and operational levels. This approach helps in clarifying the appropriate level of management authority and responsibility for performance except that it does not address the unifying aspects (as represented in **Figure 4-6**), that is a key requirement in supply chain performance management.

Drawing from conceptualisations in Extended Enterprise (EE) literature, Bititci et al.'s (2005) framework for EE performance measurement also uses a scorecard approach. Strengths in this approach are that it focuses on aligning processes across each enterprise to deliver shareholder value and customer value. Also it uses shared targets and shared metrics. This is perhaps easier to implement in EEs as an EE is a chain of enterprises that behave as a single enterprise trying to maximise the corporate goals of the EE whereas supply chains consist of individual organisations, each trying to maximise its own performance (Bititci et al. 2005).

These frameworks point to a need for strategic framework that coordinates the management of the performance measuring process, its metrics, the business strategy and the supply chain strategy to deliver shareholder and customer value as portrayed in **Figure 4-7**. Therefore the intent of the framework proposed is to complement these approaches by addressing these needs and assessing the practicality of business performance management systems (BPMS) in supply chains.

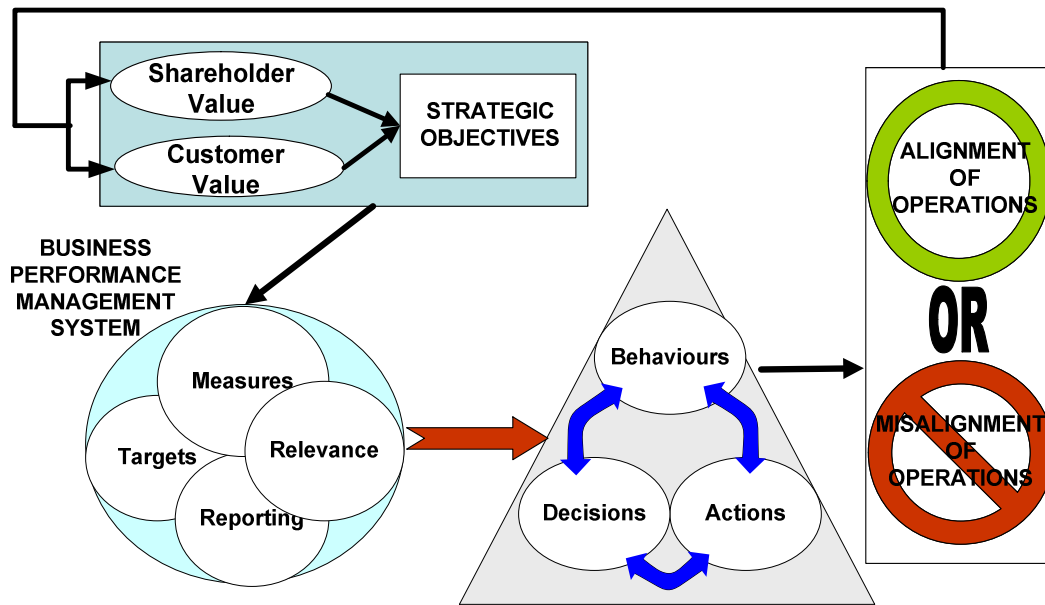


Figure 4-7: Impact of performance measurement on responsiveness

The Value Gaps approach on **Figure 4-6** has revealed that the underlying premise of value creation within supply chains lie in the conceptualisation that at every interface value is either created, maintained or lost. It is proposed that the ability to manage these potential value gaps through a business performance management system (BPMS) will lead to improved alignment with shareholders and /or customers. Therefore a precursor to the framework is that customer and shareholder values are built into the strategic objectives. These objectives represent strategic intent and they need to be fed into the BPMS framework. It is further proposed that the output of a BPMS is behaviours, decisions and actions that lead to alignment or misalignment of operations. The extent of alignment or misalignment determines if or how much shareholder value and customer value is delivered and hence how appropriate the organisation or supply chain's response is to the market.

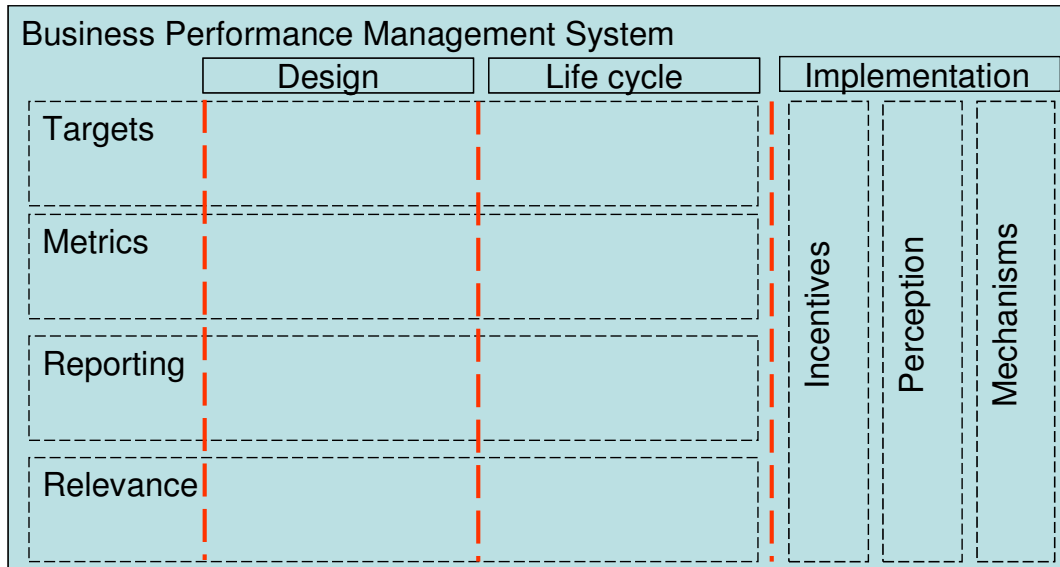


Figure 4-8: BPMS framework

The BPMS framework (**Figure 4-8**) consists of four elements that include:

Targets - Translating strategic objectives into targets and specifying levels of target setting within the business and externally.

Metrics - Translating the strategic objectives into correlating metrics.

Reporting - The manner in which progress is reviewed, including the regularity of reporting, ensuring that the content of discussions is relevant to the strategic objectives.

Relevance - This deals with the unit of analysis, stakeholder involvement especially at the potential value gaps, such as to ensure that the whole system (metrics, targets and reporting), individuals, functions and processes are aligned with strategic objectives relative to a particular value segment.

The BPMS framework proposes that the elements of the system need to be managed from three aspects that are: *Design aspect* - which deals with the initial setting of an element within the system; *Life cycle aspect* - which addresses the need to review the whole system or elements of the system to ensure consistent match with strategy and highlight areas that need changing; *Implementation aspect* - this relates to factors associated with implementing and managing the whole system.

4.3.3.2. Design Aspect - Measures

The ability to translate strategic objectives into correlating metrics is important for the success of the decision making capability of an organisation or supply chain yet it appears to be a challenge in industrial settings (O'mara et al, 1998). Maskell (1991) proposes that measures should be simple and easy to use. Time, cost and quality, flexibility and control of uncertainty / dependability metrics are typically echoed by researchers in operations management (Toni and Tonchia, 1996; Neely et al, 1995; Beamon, 1999; Toni and Tonchia, 2001; Harrison and van Hoek, 2005) as a means to deliver customer value whereas shareholder value measures include EBIT, EVA, and dividend yield. It is proposed that the extent to which an organisation prioritises on any of these dimensions is dependent on the characteristics of the defined segment (customer value) and the shareholder objectives for the organisation / supply chain (e.g. dividends, capital growth). Another key challenge is the development of predictive or forward-looking indicators that provide insight into how a business will perform in the future as opposed to lagging or historical measures that simply report how the organisation performed in the past (Wilcox and Bourne, 2003). It is proposed that the timeliness of the reporting process and the sharing of forecast data can help to alleviate this.

4.3.3.3. Design Aspect - Reporting

The manner in which reporting is conducted can effect the behaviours, decisions and actions that are taken making it an important element of the BPMS framework. Maskell (1991) advises that it is used to foster improvement rather than just monitor progress and Franco-Santos et al. (2004) adds that it will influence behaviour and so it is necessary condition for it to be used as a directional, informational and motivational device. Daugherty et al (1995) assert that systematic operational exchange can increase reaction time advantages and operating efficiencies as well as cement the interdependent nature of relationships between entities. So it is proposed that for reporting to be most useful it has to be performed at agreed intervals with its key stakeholders; timely to provide fast feedback to its key stakeholders (Maskell, 1991) such that actions can be taken to improve performance; it also has to be accurate with

issues shared and discussed with relevant stakeholders to produce agreed action plans that will make the organisation / supply chain responsive.

4.3.3.4. Design Aspect: Target setting

Performance target setting is an extremely controversial topic and the problems associated with it often result in arbitrarily derived targets that are often not integrated with strategic needs (Maskell, 1991). Much of management target setting derives from the need to motivate staff. However these can be at odds with process capabilities and competitive imperatives (Maskell, 1991). Targets have to be relevant, encourage cooperation, and meet an overall strategic objective and often it is such behaviour that it is intent on rewarding or compensating (Franco-Santos et al., 2004). It is proposed that target setting is a key element to inducing behavioural change (**Figure 4-9**) and that within a supply chain, different types of target setting levels are proposed with an indication as to whether they will generally be an enabler or inhibitor to meeting overall objectives.

- *Individual:* This is almost always an inhibitor because they are set objectives that take a narrower scope.
- *Process:* This is almost always an enabler as a broader scope is taken that is based on overall results.
- *Functional:* This is almost always an inhibitor as strategic objectives are split out such that the overall picture is narrowed and can sometimes provoke internal competition.
- *Strategic/ organisational:* This is almost always an enabler intra-organisationally but an inhibitor on a supply chain level as most supply chains do not have a set supply chain objective that is shared by all members.
- *Supply chain:* target setting tends to depend on where the power lies in the supply chain and its complexity. Some customers are more dictatorial and can set cost reduction targets on their suppliers that may have future adverse effects.

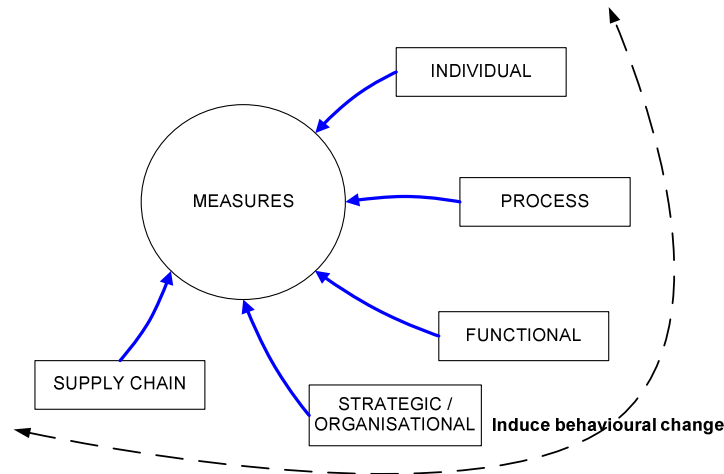


Figure 4-9: Target setting levels in a supply chain

4.3.3.5. Design Aspect: Relevance

In previous sections it has been established that distinguishing the appropriate unit of analysis to segment/ differentiate the entire supply chain on, is a key criteria for successful customer value and shareholder value creation. Therefore the proposed ‘relevance’ aspect of the BPMS framework is key to devising process measures based on appropriate unit of analysis for a segment could mean that shareholder value creation can be monitored by segment. This way, non-profitable segments are quickly identified giving the organisation opportunities to make decisions around improving or changing strategies / processes associated with that segment; or even eliminating it altogether. The relevance element also deals with value gaps that exist within the framework and ensures that all stakeholders are represented.

4.3.3.6. Life Cycle Aspect

Performance measurement system needs to be transformed when new strategies are introduced to the system (O'mara et al, 1998). O'mara et al. (1998) found in their research that changes to performance measures at the operational level were rarely mentioned and that key performance outcomes rather than key performance drivers addressed the effectiveness of actions connected to strategic decisions such that it was much more likely that the focus on a new performance measure would occur if a more relevant measure was already in place. Other elements in the performance system that may require a change or become obsolete (Toni and Tonchia, 1996; Maskell, 1991) as

new strategy is introduced and this may require refocusing on a different set of performance measures on which data are available; the development of new and more relevant measures to facilitate the achievement of new strategic goals; a shift in emphasis of key performance indicators; or elimination of obsolete measures. A change in the market may also mean that the unit of analysis will need to be redefined so it is proposed that each element of the BPMS framework is reviewed and with relevant stakeholders whenever strategy changes.

4.3.3.7. Implementation

It is proposed that for the successful implementation of an integrative BPMS there are some factors that need to be managed. These factors are influenced by firstly the *incentives* in place such that acceptance, compliance, understanding, usage and commitment to the system is acquired and people are working together. Secondly *perceptions* and opinions of individuals based on their disciplines, beliefs, existing information, previous attempts and knowledge of the system and finally the existing or available *mechanisms* within the environment such that the BPMS can move from a fragile to a strong & ultimately robust and dynamic system with appropriate structures, software, physical processes & facilities. These factors are indicated on **Table 4-8**.

Table 4-8: Implementing BPMS

Factors	Incentives	Perceptions	Mechanisms
Internal competition	✓		
Inappropriate target setting	✓		✓
Fragmentation of ownership	✓	✓	✓
Understanding and identifying appropriate customer segments		✓	✓
Organisation structure			✓
Difficulty in executing new strategies			✓
Demand uncertainty		✓	

4.4. Propositions and Implications for the research

The systematic literature review has led to the development of some key frameworks that will form the market responsiveness model. Therefore the following are a list of propositions that will be tested from the frameworks:

- 1) Competitiveness is about maximising shareholder value and organisations can maximise shareholder value by creating customer value. Other stakeholder values are only important if they impede or facilitate shareholder value.
- 2) Value gaps model (**Figure 4-6**) can identify areas where value is potentially created; maintained or lost thus having an impact on the ability of an organisation to maximise customer value and shareholder value.
- 3) Shareholder alignment (green line on **Figure 4-6**) is predominantly driven by the strategy deployment process whilst customer alignment (yellow line on **Figure 4-6**) is predominantly driven by the supply chain alignment. However maximum shareholder and customer value is produced when the supply chain is appropriately aligned.
- 4) The strategy flow process (or strategy deployment) proposed on **Figure 4-3** indicates different areas within an organisation where segmenting, decoupling and differentiating decisions need to take place. Embedding these strategies together helps to identify the appropriate variables for segmenting, decoupling or differentiating such that the supply chain unit of analysis is identified and appropriate operational paradigm is employed giving the organisation and its supply chain the best chance to maximise customer value and shareholder value. This same unit of analysis needs to be applied to the BPMS in order to maintain alignment.
- 5) Shareholder value and customer value need to be built into strategic objectives that are in turn translated into a BPMS to effect the behaviours, decisions and actions that ultimately lead to alignment (value creation) or misalignment (value lost). All elements of this process (**Figure 4-7**) including the BPMS elements have to be present in order to enable this alignment.

- 6) A key nature of the BPMS is that it should be integrative. This means shared measures, shared action plans, process targets and reporting with stakeholders that fall under its unit of analysis.
- 7) The key enabling and inhibiting factors (**Section 4.3.2**): including BPMS factors need to be tested for their impact as it may depend on the context.

A number of authors have highlighted that supply chain strategy is context specific (Christopher and Towill, 2001; Childerhouse et al, 2002; Chopra and Meindl, 2001) and for this reason no operational paradigms have been proposed as it is expected that the ideal solution for a particular supply chain may be a hybrid of the most prevalent ones. This means however that in order to test how generic the proposed market responsiveness model is it should be tested in different industrial contexts in order to identify aspects that are context specific and aspects that are generic. The matrix of organisational response in **CHAPTER 2** depicts the characteristics of the value disciplines of Treacy and Wiersema (1993) and the acuteness of their response requirements. Therefore it is proposed that the model is tested in three extreme industrial contexts (**Table 4-9**) aligned with Treacy and Wiersema's (1993) value disciplines to make it possible to identify generic and context specific issues. The next five chapters present the results of these tests.

Table 4-9: Selecting case studies

Focal company	Industry	Value discipline
PilotCo	Consumer goods	N/A - Pilot testing
ElecCo	Capital equipment	Customer Intimacy
AutoCo	Automotive parts supply	Product Leadership
FMCGCo	Consumer goods	Operational excellence

4.5. Summary of Chapter Four

Deconstructing market responsiveness has revealed three attributes of responsiveness that are the strategic attribute (primarily driven by strategic alignment); the infrastructure attribute (primarily driven by the operational paradigm); and the control attribute (primarily driven by a performance management system). To further the development of a market responsiveness model a systematic literature review was carried out in the areas of strategic alignment, performance management systems and

competitiveness in supply chains. The review highlighted some key points from which a number of frameworks have been conceptualised as part of the market responsiveness model. These frameworks include:

- 1) A strategy flow process that highlights areas within an organisation where key segmenting/ decoupling / differentiation decisions are made based on appropriate variables in order to identify the most appropriate unit of analysis to maximise shareholder value and customer value;
- 2) A value gaps model that highlights areas within an organisation where value is potentially created maintained or lost;
- 3) A list of the enabling/ inhibiting factors that should be managed in order for an organisation or a supply chain to be responsive;
- 4) And finally as a result of identification of desired qualities of a performance management system that supports both intra-organisational and inter-organisational alignment, a BPMS framework. Whereas a review of competitive advantage has revealed generic strategic objectives of satisfying key stakeholder 'values' that, in turn, need to be translated into an organisation's PMS. Hence it can be derived from the review that 'value' is the source of competitive advantage.

CHAPTER 5.**Pilot Case Study: Applying Framework to PilotCo**

The purpose of *Chapter 5: Pilot Case Study* is to:

- To present the findings from piloting the framework on PilotCo.
- Establish aspects of the research design that need to be modified
- Establish feasibility of study to ensure that it will lead to answers to the research question.

5.1. Background to PilotCo

PilotCo is a European-based manufacturer of prepared, ready-to-eat salads. The company has about 200 employees and makes over £7 million in revenue. Its core competence is considered to be its ability to produce premium quality with innovative recipes. PilotCo is part of a group that is floated on the stock exchange. It is co-located with some of the other factories in the group.

5.1.1. Firm orientation

Firm orientation is primarily based on creating long-term shareholder value. However the firm's approach to creating shareholder value is by forming partnerships with customers to provide excellent quality, price, service and innovation to the consumer's delight. The belief is that by growing their customer's business their business will grow. For this reason PilotCo takes a particular interest in the consumer markets too. Other stakeholders and their impact on shareholder value and customer value creation are listed on **Table 5-1**.

Table 5-1: Stakeholder proposition

Stakeholders	Proposition
<i>Shareholder</i>	Maximum value created and measured in terms of – Group turnover; Total operating profit; EBITDA; and Earnings per share.
<i>Customers</i>	Partnership approach ; want innovative safe products; product with agreed specifications (customer brands) and quantities; integrity in plans (especially for new products as a very competitive market)
<i>Employees</i>	The group has grown through acquisition of smaller businesses, also the natures of the environment they have to work in make sit difficult to obtain and retain good staff. Recruitment and retention of excellent people, investment in first class facilities and strong support for innovation throughout the business will turn the vision into reality.
<i>Government/ Legislative</i> particularly: <ul style="list-style-type: none"> ▪ Occupational health & safety ▪ Food standards agency 	Health & safety of employees – accidents, working conditions; safe, legal quality foods produced under stringent control & hygiene conditions (HACCP). Pollution reduction, reduction in resource usage
<i>Suppliers</i>	Ethical trading; continuity of business
<i>Community</i>	Engagement in local community initiatives such as education and charities.
<i>Pressure groups</i>	Non-genetically modified ingredients

5.1.1.1. Competitive context and market drivers

The Consumer: Changes in, and influences from, demographic, lifestyle and economic trends have been the key impetus behind the increase in demand to PilotCo. Consumers had become used to the range of fresh prepared foods on offer and are increasingly influenced by three key factors that shape the fresh prepared foods markets (see **Figure 5-1**).

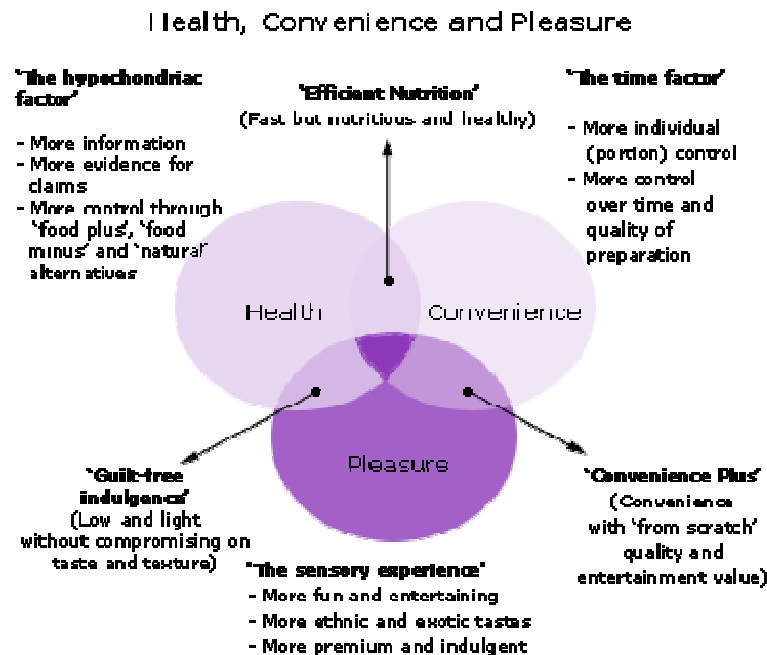


Figure 5-1: Factors influencing consumer demand *Source: Datamonitor*

Customer demands and differentiation: PilotCo's customers are primarily major food retailers and a few restaurant chains. Over 60% of its business comes from one customer, PremCo. PremCo is recognised for being the premium range retailer in its market with the advantage of a long reputation as originators and premium quality. Consumer demand for health, convenience and pleasure has meant that PremCo's competitors had started to introduce their own premium ranges of which they offered similar recipes at competitive prices.

Legislation and external influences: Strict legislations on food safety and increasing support for local produce and environmentally friendly packaging have added to the

competitive context of the salad market and also the complexities of PilotCo's ability to meet increasing consumer demand.

Costs and profits: Increasing costs of raw materials together with increased power of retailers and pressure to create shareholder value have meant that PilotCo cannot continue to work in the way that it has done in the past.

Development in technology: The rate and pace of technological development particularly in this section of the industry is slow due to the nature of the raw materials. PilotCo therefore heavily relies on manual labour to get the work done.

People: The PilotCo factory located at low cost settings, that is close to its rural suppliers but this means that finding skilled employee is difficult. Moreover due to the nature of the product – factory temperatures have to be kept low. This in turn discourages people from working there. Sickness and absence rate is higher compared to other industries. PilotCo compensates through higher than average pay to attract staff.

The nature of these drivers in PilotCo's industry means that competition is increasingly intensifying; the nature of the product (shelf life of three to four days) is such that it has to be made on the day of order. Hence the intensity of competition is such that shareholder value and customer value can be easily lost at PilotCo when it does not respond appropriately to its market.

5.2. Strategic alignment

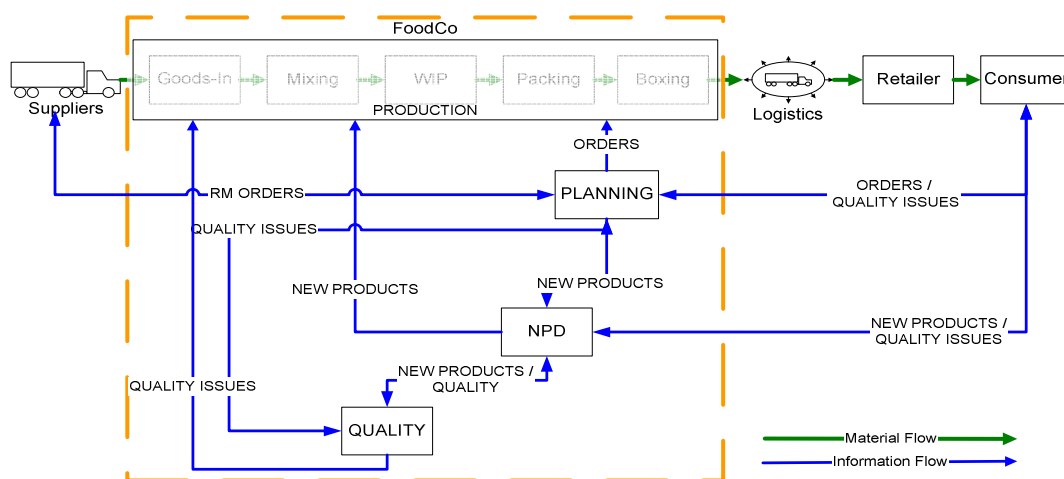


Figure 5-2: Supply chain at PilotCo

5.2.1. Strategy flow

PilotCo has multiple customers and was aiming to reduce costs in order to retain its major account (PremCo), a retailer that brought in over 60% of the business, and be profitable. The study was therefore scoped around its key customer.

Table 5-2: PilotCo Strategy Levels and description

Strategy Levels	Characteristics
Business Unit Strategy	Decentralised management teams will be empowered to concentrate on specific product categories and look after the development of each of our customers. These teams will benefit from both synergies and cross fertilisation of knowledge across Group. <i>Differentiating variable: by products then by customer</i>
Market strategy	A partnership approach with customers. PilotCo works together with its customers to develop new products that are specific to that customer. <i>Segmentation variable: Customer</i>
Supply chain strategy	No complete supply chain strategy defined. Planning: shiftly to daily to weekly to 13weekly to yearly Source: Outsourced but within group Deliver: Outsourced to a logistics company Supplier alignment: A majority of PilotCo's suppliers have been pre-selected by its customers to maintain consistency in the quality of the product. <i>Segmentation variable: Customer</i>
Manufacturing Strategy	Operational Excellence Variables: Delivery reliability, capacity, no of lines, no of staff, machine flexibility, dressings <i>Differentiating variable: by product (complexity), by volume and by line availability</i>
Product strategy	Development and marketing products for customer brands: Variables: life cycle, shelf life

5.2.2. Alignment of BPMS

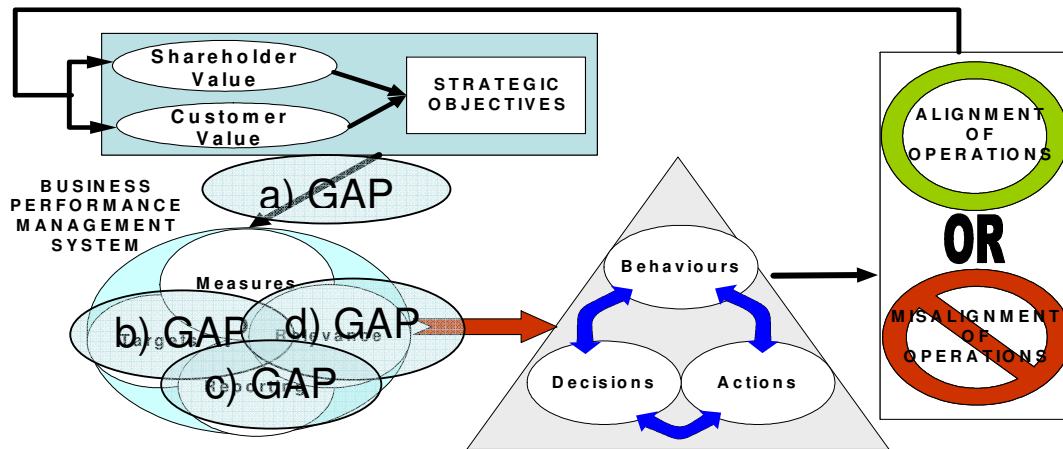


Figure 5-3: Alignment gaps at PilotCo

Figure 5-3 depicts the alignment gaps which were identified from PilotCo's strategic deployment process. PilotCo had no fixed approach to strategy deployment. A typical approach would be that the Managing Director would discuss group changes and financial targets to functional heads. Each functional head would then pass on the message in their own style to their team, setting them objectives with little idea of other objectives being set by other functions.

The alignment gaps identified in **Figure 5-3** relate to:

- a) Strategic objectives not linked to the BPMS
- b) No target setting process within the BPMS
- c) No fixed reporting process
- d) BPMS not linked to customer segments

This meant that decisions that were being made at the operations level that were not linked to strategy. Further these decisions were based on the operations team experience of what they felt was good operational practice.

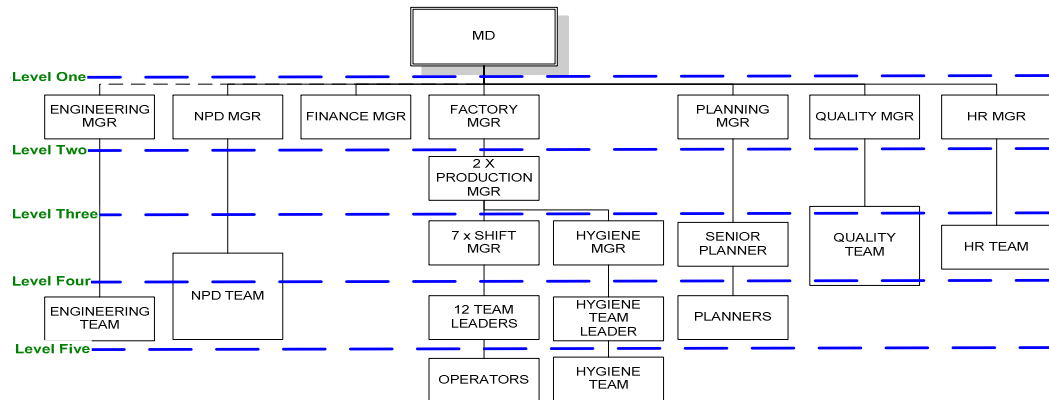


Figure 5-4: PilotCo's Organisation chart

Figure 5-4 describes the structure of the organisation and **Table 5-3** identifies value gaps at PilotCo. These gaps generally meant that staff below Level Four did not have an opportunity to make a contribution to improvements. A majority of them were keen on making improvements there but the ad hoc reporting style and their separation from Shift Managers made it difficult for them to make an input.

Operations managers found it difficult to resource lines as demand volumes were unstable. Their tendency was to bring in additional agency staff which, they had to order a day before and this meant that they often had more human resource than required.

The existing culture within PilotCo is closely associated with its history of high profit margins; however an increase in competition, coupled with its complacent approach to customer service meant that things needed to change as PilotCo had become a loss making business that was losing competitiveness.

Table 5-3: Value gaps at PilotCo

Value gaps	Description
Hierarchical	<ul style="list-style-type: none"> From level three onwards staff had little knowledge of what the strategy is; how the organisation is performing; and what the key priorities are. There was a particular gap between level three and level four as little interaction occurred between that level of management and their team.
Functional	<ul style="list-style-type: none"> New product launch is often not communicated in time and neither are trials. NPD team use their hierarchical position to disrupt lines in order to run product trials. This often led to late deliveries; reduced productivity; material shortage in production; volume shortage in deliveries; and waste. The short shelf life of the products meant products had to be made on the day. However the customer will often call to either increase or decrease their EDI order that resulted in waste or shortage as planning only scheduled production once. This had an impact on resource planning within operations as the tendency was to over resource that meant less productivity and less shareholder value.
Layout	<ul style="list-style-type: none"> Shift managers spent most of their time in their offices and Team Leaders would have to come out of the factory to alert them of significant issues or sometimes they tried to sort it in their own way because they did not want to disturb the managers. NPD is locked away in a '<i>creative suite</i>' at quite a distance from the factory. This limited their interaction with other functions and they were seen as being '<i>in a league of their own</i>'. The engineering resource is shared with other factories and located at central point. Whenever there were issues with capital equipment it was a case of which factory had the most influence on the engineering team.
Financial	<ul style="list-style-type: none"> Each functional head was a cost centre and so there was a battle for resources, particularly talent due to the location of the factory.

5.3. BPMS Framework

The data display on **Table 5-4** is a summary of the BPMS at PilotCo and provides evidence for the value gaps identified in the previous section. The key metrics used at each entity identifies the focus of that entity and the motive behind its behaviours, decisions and actions. Some arising conflicts as a result include:

Financial reporting could not identify the sources of waste which contributed to the loss. It was believed that Production had the most waste since it was responsible for 37% of the factory costs. So Production was tasked with minimising waste and maximising productivity and its managers bonuses were based on that. This meant that they were not keen on conducting new product trials especially as it had an impact on their performance. Most managers would pass any trials onto the next shift such that their individual targets were not affected. On the other hand, NPD's bonuses are based on creating new products. NPD are in regular contact with the customer to try to create continuity of business by helping the customer compete with the influx of competition through the introduction of new products. Their approach to conducting new product trials, of which samples are sent to PremCo, shows that they are willing to create customer value at the expense of shareholder value. While Production's targets were predominantly driven by shareholder value creation and they were willing to create this at the expense of customer value. **Figure 5-5** indicates the tensions at PilotCo as a result of its existing BPMS.

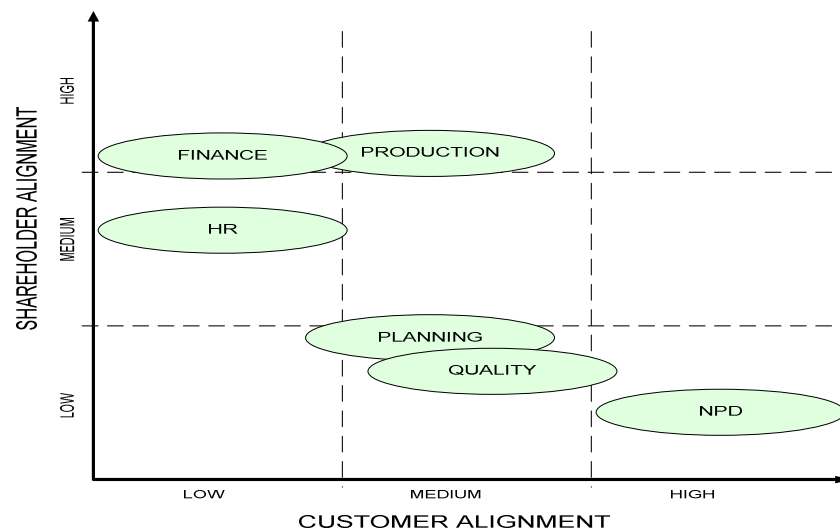


Figure 5-5: Functional tensions at PilotCo

Table 5-4: BPMS at PilotCo

Entity	Objective	Key Measures & targets	Reporting
PremCo's objective (Customer value)	Cost effective purchasing of innovative premium quality salads; Minimise purchase price; Maintain premium; Provide innovative products	Purchasing costs Quality, OTIF, new products	Monthly with PilotCo
PilotCo's objective	Minimise costs to be best price for quality; Introduce new products to stay ahead of competition	Total operating profit; Gross margin contribution	Monthly at top management level
Planning	To provide cost effective scheduling and maximise use of resource	Forecast accuracy, Customer service - OTIF	Internal to Planning and informal.
Goods-In	To provide Make with raw materials needed to make daily production, minimise waste	Material disposal, Availability of raw materials	None
Quality	To ensure premium quality of products and meeting food regulatory standards	None	Weekly and cross-functional
Production	Cost effective production of good quality fresh salad products to all customers	Productivity, OEE, downtimes	Ad hoc, informal and within Production
NPD	Creative design and introduction of new products & processes	No of pilots conducted; Financial value of new products introduced	None; irregular & informal communications with Production and Planning
Logistics	On time delivery of products to customers	OTIF	None

Planning has a conflict between its role and its metrics. Its cost-effective scheduling could create shareholder value yet its measures are focused on customer value creation. This meant that Planning paid little attention to enhancing the efficiency of the factory – orders were received on EDI first thing in the morning and Planning would schedule for the day and will not amend the plans although the customer may have called in to increase or decrease demand. This led to ineffective use of resources and ultimately loss in shareholder value. The cause effect diagram on **Figure 5-6** depicts the cost of inefficient use of resource at PilotCo.

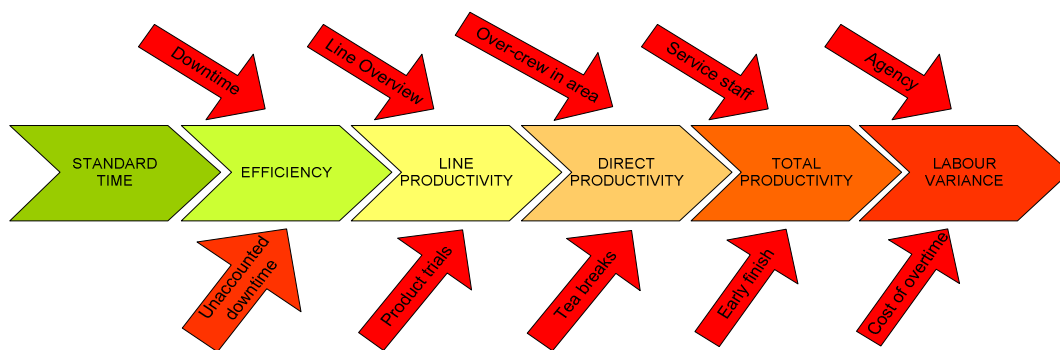


Figure 5-6: Impacts on productivity at PilotCo

A major cause for loss in shareholder value was material waste but management reporting could not identify its source. Production yield was often low and it was initially perceived items were being thrown away in production. Each function blamed the other for waste. PilotCo set up a cross-functional team to jointly resolve the problem that resulted in the cause-effect analysis on **Figure 5-7**.

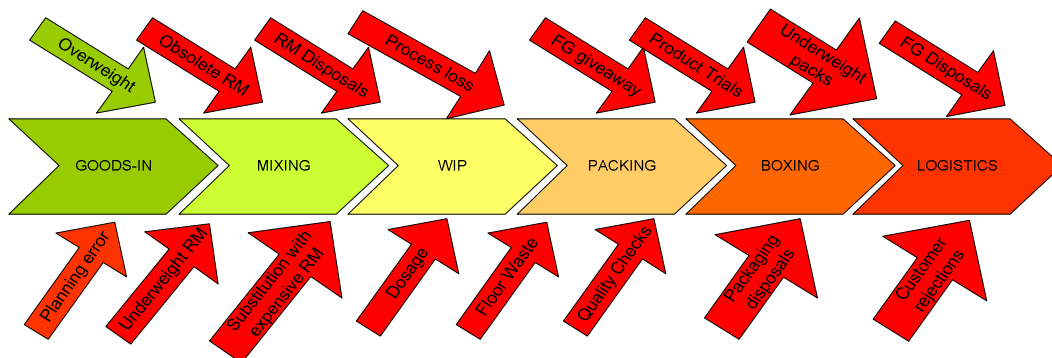


Figure 5-7: Sources of material waste at PilotCo

Table 5-5: Managing implementation at PilotCo (Before → After)

Factors	Incentives	Perceptions	Mechanisms	Example
Internal competition	☹ → ☹	N/A	☹ → ☹	No change – a difficulty as it has always been the culture. Top management has a bias towards highly performing functions.
Misaligned target setting	☹ → ☹	☹ → ☹	☹ → ☹	Same strategy deployment process in use of which functional managers still set individual objectives and targets for their areas. Bonuses were still set on the same basis.
Fragmentation of ownership	☹ → ☺	☹ → ☺	☹ → ☺	This was improved primarily through the reporting process. Having key stakeholders at meetings led to joint problem solving with each stakeholder taking responsibility for arising issues.
Understanding & identifying appropriate customer segments	N/A	☹ → N/A	☹ → N/A	PilotCo became a dedicated manufacturing site for PremCo which eliminated the issue of dealing with multiple customer segments with varying needs on one system.
Organisation structure and design	N/A	N/A	☹ → ☹	Facility & Group constraints meant little could be done to change the existing structure and layout to a more enabling one. However the move to a formalised way of working meant its impact was reduced.
Difficulty in executing new strategies	N/A	☹ → ☺	☺ → ☺	Initial reluctance to follow the new process was based on previous failed attempts at improvement. Top management was vital and with a principle of ‘If in doubt ask someone who knows!’ the use of consultants helped their implementation.

☹ - Inhibiting

☺ - Enabling

N/A – not applicable

5.4. Workshop and Implementation

The presentation of the data to PilotCo led to some significant changes. PilotCo decided to implement a BPMS that would enhance its ability to make key management decisions such as to eliminate waste and non-value adding activities within its business. Material disposal became a shared metric and cross-functional reporting was introduced at all levels of the organisation except Level Five. **Figure 5-8** depicts the agreed levels of reporting at PilotCo. Introducing cross-functional reporting meant that priorities were agreed on a daily basis such that shop floor staff knew what they had to do. Material disposal became part of the daily report whereby all the areas involved in waste (**Table 5-6**) recorded their waste into the same reporting system. By sharing an objective for waste reduction, functions were able to work together to make significant reductions on waste. However, sharing other targets proved to be polemic.

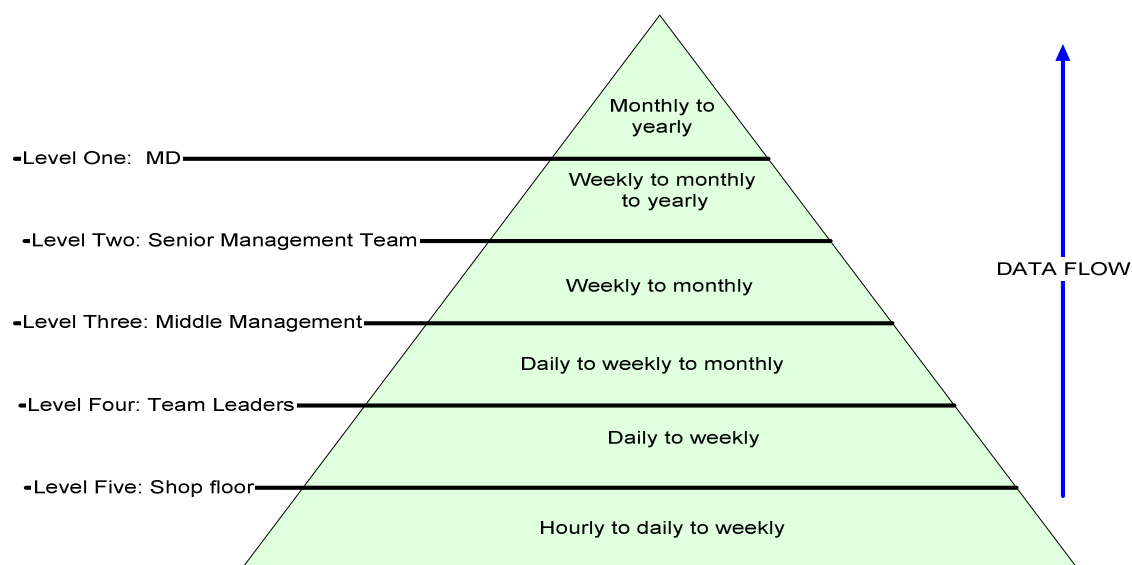


Figure 5-8: Frequency of reporting at PilotCo

Shift Managers were encouraged to frequently go into the factory to conduct hourly reviews. This way, arising issues were dealt with in time to boost daily performance. Their improved understanding combined with an introduction of a predictive aspect to their performance management system meant that they were better able to resource the factory lines to operate efficiently. The consequential gain in productivity was rewarded in their

performance review increasing their inertia to sharing targets with other functions. **Table 5-5** explains some of the enabling and inhibiting factors.

The improvements also helped PilotCo to enhance customer value by sharing some of the cost savings with them. It also helped to identify profitable and non-profitable segments. As a result PilotCo redeployed some of these products to other factories within the Group; close the doors to others and became a dedicated factory for PremCo. This meant that even when its competitors would try to offer new products to PremCo, PremCo would offer the products to PilotCo to make a version of it.

5.5. Competitive And Strategic Response (Retrospective Look)

The prevailing tension within PilotCo was its mode of competitiveness. Evidence from the consumer market showed that the organisation needed to drive towards customer intimacy and product leadership but it had developed an expertise in operational excellence. This was particularly apparent in the conflict between NPD priorities and Production priorities on the shop floor. Such conflicts had led to sub-optimisation particularly because the individuals involved were provided a stimulus to pursue their misaligned goals. **Table 5-5** explains how these inhibited responsiveness whilst **Table 5-6** is, in the perspective of the researcher, an alternative approach for enhancing the responsiveness of PilotCo to its market. Overall the BPMS (**Table 5-4**) identified at PilotCo was being used to serve multiple customer needs without specifically addressing the needs of any segments. The move to a customer intimate strategy with PremCo meant that the unit of analysis of the supply chain became more appropriate as the BPMS became focused on the specific needs of PremCo. This on its own however was not sufficient for maximising shareholder value and customer value as the gaps in shared targets and metrics (**Table 5-6**) still existed; and these accounted for the behaviours, decisions and actions highlighted in the first paragraph of this section. This highlights a key finding that ownership structures and their corresponding accountabilities; and the *integrative* quality of the performance management prove to be a key enabler for aligning stakeholder needs within a supply network in order to be responsive to market needs. The next section translates the findings from this case study into theoretical proposals that will be tested in the subsequent cases.

Table 5-6: Retrospective enhancement of PilotCo's functional targets

	New targets	Explanations
Planning	Forecast accuracy; productivity; capacity utilisation; No of pilots completed; Material disposal; Forecast accuracy; On time delivery of products	Could enhance its forecasting by working closer with PremCo. Could help resolve conflict between Production and NPD by scheduling in trials. Could contribute to waste and productivity by updating schedules.
Goods-In	Material disposal; Availability of raw materials; Availability of pilot raw materials; On time delivery of products; Productivity	By ensuring designated raw materials available, and in good quality, for daily production and trials can contribute to improving productivity, OTIF and waste.
Quality	Assessment of pilot & existing products; Material disposal; On time delivery of products	Pre-assessment of new products means that waste and productivity can be avoided during launch. Could take some responsibility for waste as a result of poor quality. Speeding up assessment can mean issues can be resolved quickly to meet delivery schedules.
Production	Productivity; capacity utilisation; downtimes; No of pilots completed; Material disposal; On time delivery of products	Adding pilots to their targets and on their plan would help them to cooperate better with NPD to meet the innovation targets and better manage expectations of PremCo.
NPD	No of pilots conducted; Financial value of new products introduced; availability of pilot raw materials; Material disposal; productivity; on time delivery of products	Taking some responsibility for productivity and waste can mean that product is designed for ease of manufacture; smooth product launch; and enhanced shareholder value.
Logistics	On time delivery of products; On time delivery of pilot; Material disposal	Can take some responsibility for the quality of product that arrives at PremCo – waste due to handling.

5.6. Theory Building From PilotCo

The case of PilotCo indicates some of the various levels of decisions companies have to address in order to become responsive to their market. Firstly market decisions have to be understood and addressed in order for organisations to know what competitive capabilities they need to develop. Decisions about developing competitive capabilities for a market needs to be matched with the motive of the organisation; subsequently all these decisions have to be lined up with the supply chain design in order to maximise the value appropriated from the organisation's choice of response. However from this case it became fairly evident that it is a dynamic process as market conditions are not static. PilotCo had to move from operations excellence through to product leadership and customer intimacy in a short space of time. Successful implementation of such an approach is can be enabled or inhibited by the factors identified from this case. The key theoretical findings from the case of PilotCo are:

- It is hard to align externally especially when internal systems are pulling entities apart. This means that an organisation will need to be aligned internally before it can align externally with its supply chain.
- To align internally employees have to be set incentives that will allow them to work closer together. Perceived difficulties can distract from wanting be involved together. This is evident from the behaviours exhibited as even when the right systems are in place its misuse creates misalignment and hence ability to be responsive to the market. Thus it calls a need for a behavioural alignment model.
- In the history of manufacturing management Total Quality Management (TQM) showed that sharing quality targets allowed all staff to take responsibility and jointly solve issues to raise quality standards. In this case sharing material disposal targets proved to reduce material waste at PilotCo. This goes to show that when targets are fragmented it leads to blame culture, internal competition, low morale, sub-optimisation, mistrust of BPMS, and ultimately excuses rather than root cause analysis to determine opportunities for improvement. Whereas when targets are shared it leads to shared ownership, shared responsibility, joint problem solving, improved information

sharing; all relevant perspectives considered and ultimately leads to the delivery of optimal shareholder value and customer value.

- It has also been deduced from this study that there exists a Value Execution Point (VEP) that is point where communicated value is translated into realised value. In the case of PilotCo the VEP is production. This is because for a new product launch although NPD would have spent time designing and selling its concept to the customer to be approved; the realisation of that product (which would be at production) requires that its manufacturability is to the standard that is demanded from its stakeholders. Such stakeholders include the customer (will want safe and value for quality product); the employees (will want a safe process); the shareholder (will want cost effective production in order to maximise shareholder value); the FSA (want quality standards met for new products); thus the value execution point is the point where all shareholder value and customer value are realised.
- Value gaps mean that sometimes by the time material or information get to the value execution point there is less opportunity for the organisation to maximise value created. In this case where the value execution point is at production, operators were often confused as to what actions to prioritise – Pilots or Daily production? Both options lead to shareholder value and customer value creation and by planning ahead it could be maximised for both and they do not have to destroy each other.
- The appropriate unit of analysis for a performance management system is the value segment as the distinguishing features of each value segment may require different targets. Aligning the performance management system to value segments can help identify the profitability of a value segment as well as ensure customer value for that segment is being met.
- The design and lifecycle aspect of the BPMS requires the involvement of key stakeholders for it to work. All elements of a BPMS will need to be reviewed at an agreed date or periodically especially when there has been a change in strategy or a redefinition of segments or a shift into another stage of the product lifecycle.
- There is some commonality between implementation factors and the responsiveness factors. This highlights a need to review the enablers and inhibitors as some are

causally related whilst some of them are necessary/sufficient conditions. It was found in this case that managing some of these factors, such as fragmented organisation design, can minimise its impact on inhibiting behaviours decisions and actions.

Table 5-7: Enablers & Inhibitors to responsiveness at PilotCo

Factors	Before (Phase One) → After	Summary of evidence
<i>Demand uncertainty & variability</i>	☹ → ☺ Ability to recognise / anticipate demand; ☹ → ☺ Joint level of planning; ☹ → ☺ Management of product variety; ☹ → ☹ Cooperation to develop new products	Cuts and increases to orders by PremCo were found to be relative to weather conditions and forecasting improved; Planning started to involve managers in production in the planning process and resourcing improved; Planning took control of managing variety and relative performance; New product development was still done in isolation.
<i>Supply chain flexibility</i>	☹ Buffers; ☹ Inventory levels	No evidence that supply chain flexibility would have improved the responsiveness of PilotCo.
<i>Integration of information systems, functions and organisations</i>	N/A Integration of functions N/A Integration of information systems N/A Integration of organisations	It is suspected that integration of functions might enable by improving alignment but there was no evidence of this. It is possible that it may also inhibit as it limits flexibility especially for an organisation with multiple segments.
<i>Timely flow of goods and information</i>	☹ → ☺ Lead time compression; ☹ → ☺ Demand transparency; ☹ → ☺ Timely information; ☹ → ☺ Relevant and accurate information; ☹ → ☺ Open communication; ☹ → ☺ Commitment	PilotCo maximised its efficiency in order to free up capacity, reduce costs and, as a consequence, it won more business from PremCo. An improvement in the transparency and sharing of information saw an improvement in business performance.

Enabling (☺) / Inhibiting (☹) / Needs managing ☹ / Not Applicable (n/a)

	to sharing information;	
Factors	Before (Phase One) → After	Summary of evidence
<i>Organisation structure – intra and inter organisational team</i>	☹ → ☺ Process orientation and work flow structure plus inter-firm ☹ → ☹ Functional orientation; ☺ Cross functional teams	PilotCo's structure was not reorganised, rather their focus became more process focussed such that there was improvement in the ways functions worked together. However it was largely functionally orientated. Occasional use of cross functional teams.
<i>Management methods</i>	☹ → ☺ Manufacturing flow – aligned to customer demands; ☹ → ☺ Production control methods aligned with business drivers; ☹ → ☺ Synchronisation of management and workforce; ☹ → ☹ Level of complementary philosophies; ☹ → ☺ Supportive / participative management; ☹ → ☺ Leadership; ☹ → ☺ Coercive power; ☹ → ☺ Trust	The linking of planning and production control mechanisms into the same BPMS aided alignment with customer demands as well as introduce complementary approaches to matching supply with demand. It also helped with the synchronisation of management and workforce as they had a means and object of discussion. This developed understanding between the two parties, management became more supportive and less coercive. They started to show more leadership on the shop floor and this led to increasing trust between the two parties.
<i>Culture and attitudes</i>	☹ → ☹ Internal competition; ☹ → ☺ Continuous improvement; ☹ → ☺ Joint terminology; ☹ → ☺ Cooperative	Fragmented structure, internal competition and history of high profitability led to complacency and failure to recognise changing market needs and financial loss.

Enabling (☺) / Inhibiting (☹) / Needs managing ☹ / Not Applicable (n/a)

Factors	Before (Phase One) → After	Summary of evidence
<i>Shared goals, resources and benefits</i>	☹ → ☹ Incentives to remain aligned; ☹ → ☹ individual goals; ☹ → ☹ Conflicting goals; ☹ → ☹ Shared risks; ☹ → ☹ Shared rewards	The target setting mechanisms mean that there are little incentives to align and more incentives to compete. Conflicting goals became managed by setting daily priorities but could have been eliminated altogether through joint target setting and rewards.
<i>Performance measurement</i>	☹ → ☹ Decision making capability; ☹ → ☹ Joint problem solving; ☹ → ☹ Joint level of using performance measures; ☹ → ☹ Joint target setting	The performance measurement system proved to be a good communicating and decision making tool once implemented. It was found though that having all elements of the BPMS in place is necessary but not sufficient to enable responsiveness.
<i>Difficulty in executing new strategies</i>	n/a Strategy formulation; ☹ → ☹ Decision-making capability; ☹ → ☹ Stakeholder involvement; ☹ Strategy deployment process	PilotCo improved its decision-making capability through meaningful BPMS. Stakeholders particularly the shop floor became more involved.
<i>Understanding and identifying appropriate customer segments</i>	☹ → ☹ Variable identifiable and measurable; ☹ → ☹ Relevant to purchase of product and buyer behaviour; ☹ → ☹ Sufficient size for adequate return; ☹ → ☹ Accessible through available marketing channels	PilotCo moved from an arbitrary approach to dealing with the complexities of serving multiple customer segments to one that was more appropriate to its strategic aims and profitable. They were in danger of losing PremCo and the changes they made allowed them to win more volumes from PilotCo and become its first choice supplier.

Enabling (☹) / Inhibiting (☹) / Needs managing ☹ / Not Applicable (n/a)

5.7. Conclusions: Discussion and Summary of Findings

PilotCo was designed to be a pilot case and for this reason provides opportunities for research design improvement. The case was mainly focused on internal issues as so many were raised. It would be interesting to contrast this with the other cases to see if internal issues had an impact on their ability to align externally. However the timescale of the study was too long particularly due to observing implementation. The time limitation on a PhD means that it would not be possible to conduct all phases of the research process and so the following decisions were taken to resolve this:

Studying PilotCo took 18 months; even then it was not possible to fully monitor implementation. Also other changes occurring in the group started to have an impact on PilotCo making it less rigorous to attribute all the new data gathered to the implementation of this model. So a shorter timescale of three months per study will allow the researcher to capture the data at a fixed point in time with less variability. This means that the rest of the research can only compare and contrast the similarities and differences between PilotCo and the other cases. Therefore the existing model will be used as a lens to view the case company and its supply chain. This will highlight gaps with suggestions for improvement. Presenting these at focussed workshops will enable feedback, validation and co-development with the case company to improve the model. This will still enable context specific matters and generalisable ones to be extracted. Also this will mean less involvement by the researcher. Also, where possible, more customer and supplier involvement will be demanded such that inter-organisational alignment can be better understood.

A retrospective review post-workshop as opposed to observing implementation will free up time to complete the project. This will require the use of focussed semi –structured interviews with key stakeholders.

CHAPTER 6.

Case Study One: Applying Framework to ElecCo

The purpose of *Chapter 6: Case Study One* is to:

- To present the findings from applying the framework to ElecCo.
- Establish aspects of the model that can be enhanced.
- Establish feasibility of implementing such a model within a context that is similar to ElecCo.

6.1. Background to ElecCo

ElecCo is a European based business unit of an electronics manufacturer with significant global presence, particularly in the Far East and North America. ElecCo is characterised by high variety and low volume production of capital equipment. Their products are often designed to meet specific customer needs and in that respect demand is largely unpredictable. **Table 6-1** provides a summary of background data on ElecCo. ElecCo's organisational structure has four levels of staff except for operations that have an additional level of management. The physical layout was such that each of the functions was located separately.

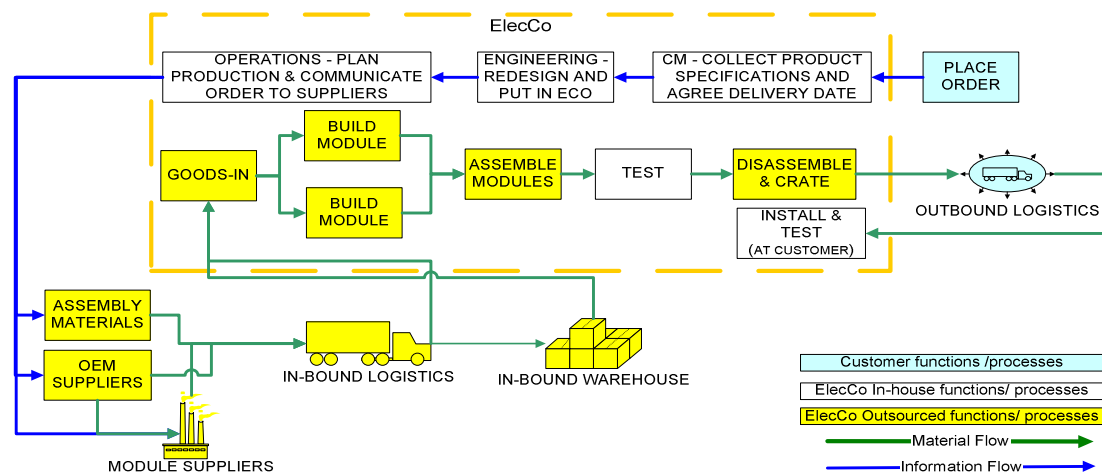


Figure 6-1: The supply chain of ElecCo

Table 6-1: Background to ElecCo

Dimension	Data
Part of Group	Yes
Contribution to Group sales revenue (%)	< 5%
Sales Turnover (£)	100 million
Net Profit (£)	< 5%
Investment in R&D	17%
No. Employees (Direct and long term contract)	< 250
Location	Global
Output / year (units)	< 100
Average no. parts / unit	54,000
No. customers	< 50; MCo brings in 80% of business
No. suppliers	< 200; < 75 direct

Table 6-2: Focal organisation interviews at ElecCo

	Senior Management (Level 2)	Middle Management (Level 3)	Functional (Level 4)	Total
Engineering	2	1	1	4
Support Functions	3			3
General (Level 1)	2			2
Customer Service	1			1
Marketing	1			1
Operations	3	2	3	8
Total	12	3	4	19
Total hours	33	5	8.5	46.5

Table 6-3: Inter-organisation interviews

	Parts Suppliers	Focal organisation	Outsource 'Make'	Outsource 'Deliver'	Total	Total hours
No. Companies	2	1	2	1	6	60.5
No. Interviews	8	19	2	1	30	

6.2. Firm Orientation

As part of a group, ElecCo as a business unit has been set financial objectives of market share growth measured by penetration and profitability improvement measured by its gross margin contribution. Shareholder value was deemed by the organisation at a senior management level to be their primary objective.

Table 6-4: Stakeholder proposition at ElecCo

Key stakeholders	Value proposition
<i>Shareholder</i>	Maximise shareholder value: improve profitability measured by GM Contribution; market share growth measured by penetration
<i>Customers</i>	New technology; customised products; confidentiality - ; long running times >90% utilisation; out put in no. of wafers
<i>Employees</i>	Continuity of employment; Morale improvement and commitment improvement
<i>Suppliers</i>	Opportunity to add value and continuity of business
<i>Government/ Legislative /Community</i>	Taxes. Continuity of employment; export restrictions; negative use of technology e.g. nuclear industry; disclosure of shipments

6.2.1. Competitive context and Market Drivers

End user demand: Since 2001 there has been a trend of weakening demand for electronic components with sporadic indications of improvements. Consumer demand for certain products such as music players and digital video recorders has increased whilst that for TV sets and video recorders have become sluggish. Recent government push for a digital television switch over is expected to offset another rise in demand. Demand for telecommunications (e.g. mobile) and computers and peripheral equipment has also slowed down whilst expectations on the performance of microprocessors are continually increasing.

Customer demands: The overall impact of demand in the highly competitive consumer market has meant that sales have been virtually static in real terms putting gross margins under pressure. Yet the imbalance of supply and demand have created an increase of product in the supply chain that has led to a reduction in customer orders; price and margin erosion as many products are chasing a finite amount of demand. The planning and construction of production plants to manufacture such sophisticated electronic equipments in high volumes typically takes two to three years and is therefore based on forecasts that are several years ahead. However the growth rates and rapid developments in technology by such products (e.g. PCs and mobile phones) make these forecasts extremely difficult and have resulted in serious overcapacities. Thus the customers of ElecCo have responded to the fall in memory prices by significantly increasing their manufacturing volumes driving such components towards near-commodity. To increase affordability some of these customers are forming alliances with themselves to jointly procure capital equipment.

Figure 6-2 describes the cost of ownership.

Legislation & external influences: No major impact in shareholder value except the 'fear' by government about the negative use of technology. Such information has to be disclosed.

Costs and profits: The impact of changes in consumer and customer markets has meant that the customers of ElecCo are not only demanding latest technology but cost effective solutions. They are looking at total cost of ownership and some have consolidated meaning that competition in the provision of capital equipment has become even fiercer as the players in this market want to come up with the solution that will become the standard of

the future. This means that the customers are no longer prepared to pay for the inefficiencies that come with the introduction of new technology hence also pushing capital equipment product towards near-commodity. This coupled with a rise in raw material prices meant that ElecCo saw a 13% drop in its revenues as a result.

Development in technology: The rate of pace of development in capital equipment technology in this market is slowing down especially as consumers have become slower to picking up new technology. Thus competition appears to take the form of technology leaps where competitors come up with advanced technology to beat existing contracted technology of a competitor.

People: The downturns in demand cycles have led to a number of lay-offs. The nature of the work demands a highly skilled workforce. ElecCo has chosen to manage this by outsourcing modules and employing on the basis of short term contracts as well as hiring specialised agency staff.

As a result, ElecCo's organisation and culture that is related with its history of high profit margins is being challenged by these market drivers.

Table 6-5 describes how the competitors of ElecCo have responded to this challenge. However ElecCo believes that its winning strength over its competitors is in product leadership.

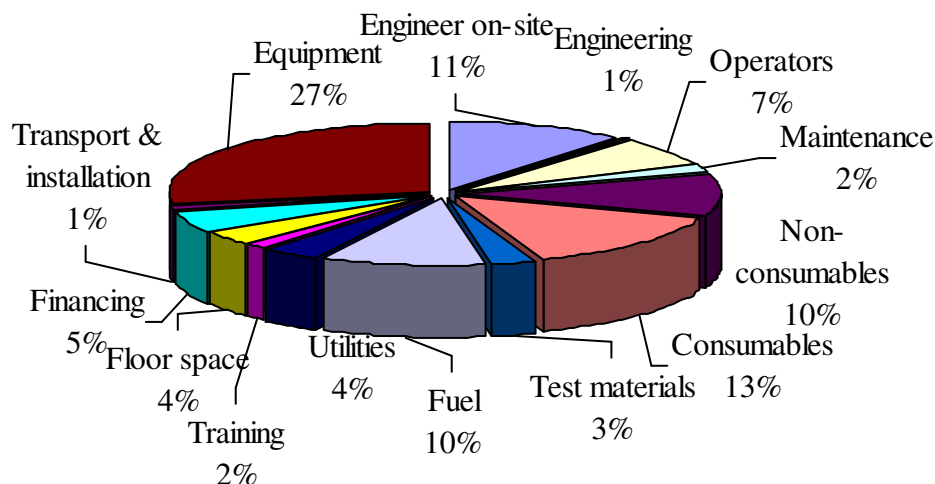


Figure 6-2: Cost of ownership

Table 6-5: ElecCo's competitiveness

STRATEGY	Elements Of Strategy	CURRENT STRENGTHS	
		ElecCo	Main Competitor
OPERATIONS EXCELLENCE	Product -design		✓modular product & software
	Customer service / Support		✓good support of product
	Operations – making product		
PRODUCT LEADERSHIP	Product	✓latest technology and faster	✓latest technology
	Customer service / Support		
	Operations	✓unique technology	✓equally matching technology
CUSTOMER INTIMACY	Product - design		
	Customer service / Support		✓intimacy with decision makers
	Operations		

6.2.2. Strategy Flow

The strategy deployment process involves a high level plan of periodic targets that is converted to strategic packages for each member of the senior management team (SMT). This is agreed by the SMT and then presented to the rest of the business unit with each senior manager presenting plans to their departments and the budgeting process begins for each department along with new product strategies that are used to build operations plans that are sent back to the board with market sizing. This takes about six months to implement and occurs every year.

Table 6-6: Strategy flow at ElecCo

Strategy Levels	Characteristics
Business Unit Strategy	This is primarily driven by the corporate strategy and centred mainly on meeting financial commitments to shareholders; improving operational performance; growth – extending business with old and new customers; and differentiated products. <i>Segmentation variable: Each business unit is specialised to a sector of the industry</i>
Market strategy	None defined. Decision variables: geographical location; customer support; warranty. <i>Segmentation variable: MCo and other customers.</i>
Supply chain strategy	No complete supply chain strategy defined. Supply chain scope was limited to purchasing and inbound logistics and the decision variable was cost. Modules are outsourced (Section 6.2.2.1) and procured in line with manufacturing start dates. Assembly parts are batched depending on economic order quantity. <i>Segmentation variable: None but mainly designed around MCo.</i>
Manufacturing Strategy	Operational excellence is the objective and they assemble to forecast. Tendency to level schedule. Decision variables: Speed, Staff availability, <i>Segmentation variable: Address customer specifications</i>
Product strategy	Innovative, new products with new technology and high specifications. Decision variables: life cycle of equipment <i>Segmentation variable: modified for customer designed for MCo.</i>

The belief that coming up with new products is important for its success so it has customer facing teams globally located to be close to its customers and target's reducing time to customers as a means of being more responsive to their needs. ElecCo uses a 'one size fits all' strategy with its customers (**Table 6-6**). Further interviews with the senior

management teams showed a lack of consistency in their opinions of what the core competence of the organisation is (**Table 6-7**).

Table 6-7: Senior management perception of core competence at ElecCo

	HR	Technical	Marketing	Operations	Finance	Engineering	CM
Operations Excellence				✓	✓	✓	
Product Leadership	✓	✓	✓	✓		✓	✓
Customer Intimacy	✓	✓	✓				✓

6.2.2.1. Supplier Alignment

ElecCo rationalised its supplier base from multiple local suppliers to a few global strategic suppliers and measures their performance using a supplier management system developed in-house. It has also outsourced some of its ‘make’ and its entire ‘delivery’ functions (**Figure 6-1**). Modular suppliers supply 70-80% of product cost. The suppliers own some of the intellectual property and the rest is owned by ElecCo. ElecCo believes that it has outsourced its non-core functions and also complexities in order to focus on its core competence.

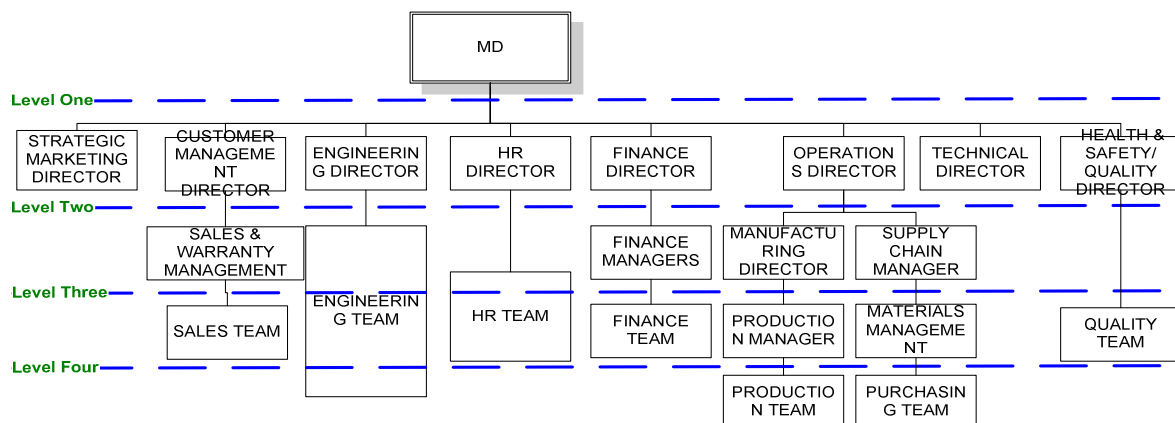


Figure 6-3: summarised organisation chart of ElecCo

Table 6-8 describes some of the value gaps that were identified in Phase One at ElecCo.

Table 6-8: Value gaps at ElecCo

Value gaps	Description
Hierarchical	<p>SMT work well together and have regular reviews, however no similar evidence is picked at the next levels.</p> <p>From Level Three (Figure 6-3) onwards staff had little knowledge of what the strategic is rather each entity pursued its own strategy.</p>
Functional	<p>There is a particular disconnect between Engineering; Operations and Customer Management (CM) around design for manufacture; product performance and meeting customer schedules.</p> <p>Decisions are made independent of other functions and the MD</p> <p>Most functions have their own independent IT systems that are sometimes a duplicate of information that is available else where.</p>
Layout	<p>The site was spread across two buildings. One building is perceived as the ‘luxurious’ block and all the directors are housed there except the Operations Director. Engineering is housed in the ‘luxurious’ block and is perceived as the favourite group.</p>
Financial	<p>Cost centre setting with no evidence of conflicts.</p>
Process disconnects	<p>Engineering often make requests to change a design after it has been commissioned however this does not go through one process, each function has a separate process for it and sometimes requests are incomplete.</p>
Organisational	<p>Despite being the most prioritised customer of ElecCo, MCo are secretive about sharing information with ElecCo and provides information in ‘bits’.</p> <p>Same applies to a majority of the customers despite having sales representatives nearby, will not share information about equipment downtime that may be useful for future improvements.</p> <p>Suppliers are late in the product development process.</p> <p>Group was using a ‘one size fits all’ to manage its businesses.</p>

6.3. BPMS Framework

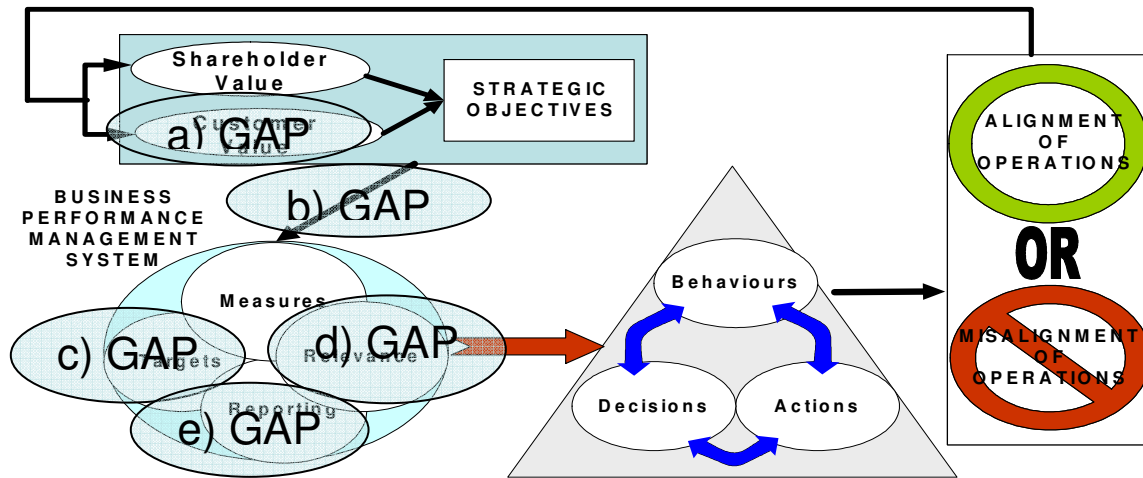


Figure 6-4: BPMS alignment at ElecCo

Using the BPMS framework to view ElecCo's process the following alignment gaps were highlighted:

- a) Despite having a well defined strategy customer value has not been properly addressed in the strategic objectives of ElecCo. The strategic plans lacked supporting analysis. This was all perhaps due to the lack of a Strategic Marketing Director at the time.
- b) Aside from shareholder value metrics there was a gap between the strategic objectives and the performance system.
- c) Functional targets were set independently by functions and these had no specific link to the value the functions were trying to create.
- d) The BPMS had no specific unit of analysis. A 'one size fits all' approach was being used. This was perhaps driven by the approach of the Group. Group set the same financial targets for all operating companies without consideration for its appropriateness to ElecCo.
- e) There was little or no performance review process taking place outside of the senior management team. **Table 6-9** details the BPMS at ElecCo with **Figure 6-5** highlighting the functional tensions that exist as a result.

Table 6-9: BPMS at ElecCo

	Targets	Metrics	Reporting	Relevance
Finance	Market share growth Profitability improvement Improve gross margin	Revenue; GM; Inventory turns	Monthly Yearly AOP	Reference point
Engineering	ECO sign off Performance reliability Cost effective new products	MTBF; MTBI; Material cost to revenue	Material cost/ weekly – operations Some monthly	Medium to Weak
Marketing / Technology	Define market requirements; Technology roadmap	To be defined		
Customer Management	Reduce support costs & Increase revenue	Uptime; I&W; MTTR	Monthly	Medium
Operations	Cost reduction	Ship to commit; Cycle time; Material cost to revenue; Non-conformance	Material cost/ weekly – Eng Monthly	Medium to Weak
Suppliers	Delivery time; Cost reduction; Supporting inventory; Product quality		Monthly – but not adhered to	Weak
Customers	Downtime/ utilisation; Recovery time Ranking			Reference point

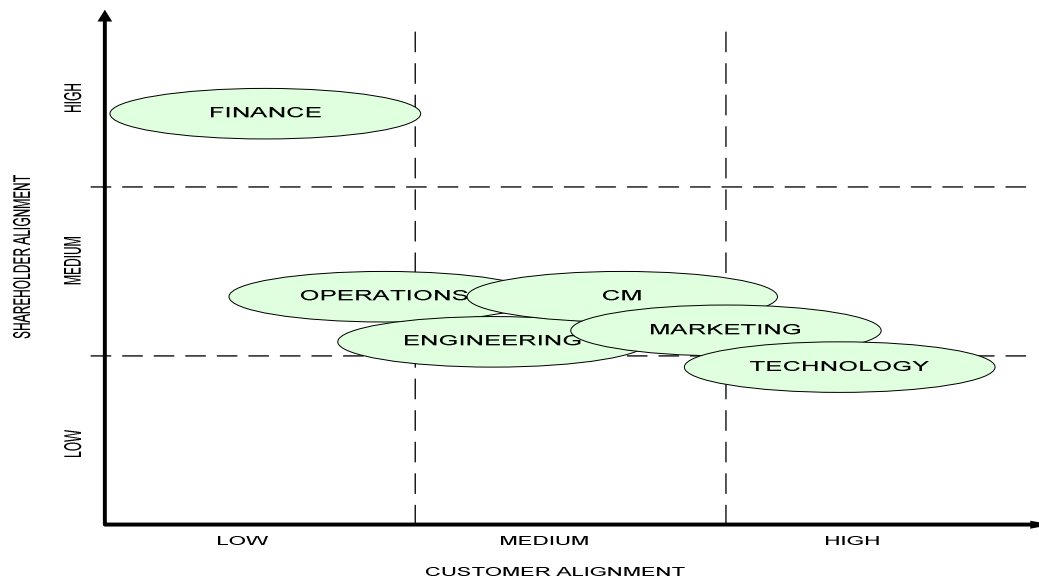


Figure 6-5: Functional tensions at ElecCo

6.3.1. Targets

The deployment process was not found to be consistent at all levels of the organisation. Due to the fragmented nature of the organisation (functional, hierarchical and layout) each Level Two (**Figure 6-3**) manager deployed it inconsistently such that within departments some functional staff were better informed than others and at Level Four and beyond the message was not getting through. Moreover between Levels Two and Three the functionally fragmented approach to the deployment of strategy meant that from Level Three onwards the scope became narrower. This led to conflicting targets and resulted in decision-making that were made in reaction to customer requests that had huge dents on shareholder value and customer value. For example, CM frequently committed to orders that were based on unrealistic ship dates, which in combination with Operation's target of on time shipping often meant that some critical steps in process were either overlooked or over resourced in order to meet ship dates and this in turn led to quality issues for the customers that cost ElecCo even more to fix as it meant having constant engineering support on customer sites.

Inter-organisationally, the customers use scorecards to measure ElecCo's performance but yet this is not fully integrated into ElecCo's performance system. ElecCo's 'one solution fits all' strategy clouded this issue further as it meant that they had failed to recognise particular needs of certain segments as performance was being measured as though both segments were the same. For example one of the segments wanted highly innovative developments and was prepared to accept quality issues as long as it is supported whilst the other wanted less highly innovative products but more reliability. Such a 'one solution fits all' approach consequently led to customer values not being satisfied by either segment as the targets set were found not to suit either of the segments.

This shows that sharing such a target (ship dates) would have been more beneficial because for CM increasing revenues was one of its targets and committing to such customer requests was considered to be delivering customer value. Sharing such a target with Operations in this respect would mean that shareholder value could also be satisfied as it may encourage CM to try and negotiate more realistic dates. In addition recognising the differences in the segments would mean that such targets could be set separately for each of the segments and both areas would work together to improve shareholder and customer value.

6.3.2. Metrics

All of ElecCo's functional areas appeared to have their own measurement system. Few metrics were shared as each calculated their own. For example a product change request is a process that involves Engineering, CM, Operations and Suppliers. Yet each measured it separately within their functions. This made it difficult to ascertain at which point a particular request was, meaning some requests could be lost in the process.

On an inter-organisational basis a similar case is found. Suppliers tended to have their own performance metrics that include customer service metrics, customers had some form supplier scorecard for monitoring supplier performance. This meant all the organisations within the scope had put resources into monitoring each other's performance.

For the framework to be 'integrative', it is proposed that points of data collection are identified along with a single point of management. This means potential loss in

shareholder value as a result of duplicated efforts, over- resourced process and potential loss in customer value in terms of lost processing of product change. Moreover other benefits that can be gained by reviewing such a process cross-functionally are lost. A similar benefit can be expected also from an inter-organisational perspective. By establishing a data collection point within such a relationship and getting together to agree what should be measured and when, such duplication can be removed and relationships improved.

6.3.3. Reporting

This took place on an ad hoc basis. Information needed to be pulled before it was produced. Often this meant that by the time the reports were received, management was making decision on historical data that was sometimes no longer relevant. Most of the reporting also took place on a functional / isolated basis, not always involving stakeholders that had an impact on the process. It also sometimes tended to be an informal process – based on existing relationships between individuals rather than a functional need to meet.

Inter-organisational meetings occurred on a regular basis with customers and not as often with parts suppliers. The nature of these meetings was not structured around performance management. Often there was a mistrust of information received that was due to a perception of either the source of the data or the way it has been collected. Customer issues, as an example, were dealt with internally on a reactive basis such that resources were taken out of longer term activities to deal with what were sometimes short term issues or repeat issues that could have been were not being collated. An example of this includes efforts to replenish a part that kept failing to a number of customers when a redesign was required. Cross-functional teams were put together to resolve these issues they worked well except their duration was short-term.

This showed that ElecCo was not reliant on its performance system for decision making as reports had to be pulled on an ad hoc basis rather than proactively pushed. Shared reporting could mean that decision making and problem solving can be faster as all stakeholders are represented and involved. This means that the timeliness, relevance and

accuracy of reporting are important to enable decision making that can impact performance during a process and not after it.

6.3.4. Relevance

Although ElecCo had two relatively distinct segments, ElecCo's 'one solution fits all' approach meant that performance was not targeted to either segment. This meant that certain aspects of reporting, and as a result decisions and actions, would not necessarily result in improved customer and shareholder values. This in combination with ElecCo's need to be innovative means that its environment would be better suited to a process oriented approach where permanent cross functional teams are set up with shared targets for particular segments. As an example, conflicting goals between the targets of Engineering (e.g. new product development), Operations (e.g. standardisation to minimise cost and ease outsourcing, ship date) and CM (e.g. increase revenue) could be balanced as a group and organised by particular segments (Marketing). These goals for a segment are only conflicting when set in isolation. Further, organising the financial structure along this setting could mean shareholder value per segment can be determined and perhaps there may be skills particular to a segment (HR).

6.3.5. Design and Lifecycle Aspect

ElecCo has inherited its current performance system from Group, meaning that some of the measures imposed by Group were not necessarily meaningful to ElecCo's setting. The Group appeared to be taking a 'one solution fits all' approach to its business units. For example ElecCo's gross margin target was being used to monitor its contribution to shareholder value. However, its calculation did not take ElecCo's high product development costs into account such that the focus on improving gross margin contribution (about 40%) mislead efforts to improve its real contribution (**Table 6-1**) as net profit was less than 5%. Most metrics when introduced were not reviewed. ElecCo would need to be able to influence the decision making process of Group.

Table 6-10: Implementation factors at ElecCo

Factors	Incentives	Perceptions	Mechanisms	Example
Internal competition	N/A	N/A	N/A	No evidence to suggest
Misaligned target setting	☹	☹	☹	Tendency to think that certain targets belong to certain functions; Varied approaches to target setting; Some shared targets with shared ownership that is linked with reward system of involved functions not just one
Fragmentation of ownership	☹	☹	☹	All hierarchical levels need to have clear defined goals, understanding how it fits with overall picture, Functional structures, misalignment with corporate, individual IT systems
Understanding & identifying appropriate customer segments	N/A	☹	☹	Unit of analysis is project based – and does not include total product life cycle. Strong perception that one solution fits all but neither segments are satisfied.
Organisation structure and design	☹	☹	☹	Functional setting with temporary cross functional teams; incomplete structure; isolated layout
Difficulty in executing new strategies	N/A	☹	☹	From reactive approach to proactive push; Little evidence of deployment beyond senior manager level
Demand Uncertainty	N/A	N/A	☹	Unsure of orders so tend to make to forecast / stock and re-assemble to order.

☺ - enabling ☹ - inhibiting N/A – not applicable ☹ - needs managing

Table 6-11: Enablers and Inhibitors to responsiveness at ElecCo

Factors	Phase One	Summary of evidence
Demand uncertainty & variability	☹ Ability to recognise / anticipate demand; ☹ Joint level of planning; ☹ Management of product variety; ☹ Cooperation to develop new products	ElecCo assemble- to-forecast and then rebuild equipment to suit orders when they arrive; Little evidence from joint level planning as sales force tend to over promise such that ElecCo finds it hard to deliver. Product development is locked within engineering.
Supply chain flexibility	☹ Buffers; ☹ Inventory levels	ElecCo has ineffectively buffered its capability to respond to customers by assembling to forecast and then rebuilding it to stock; the high cost of its modules and reworking means a detriment to shareholder value.
Integration of information systems, functions and organisations	N/A Integration of functions ☹ Integration of information systems N/A Integration of organisations	Independent information systems within functions; some individuals even have their own system that is a duplication of information that already exists elsewhere but is not shared.
Timely flow of goods and information	☹ Lead time compression; ☹ Demand transparency; ☹ Timely information; ☹ Relevant and accurate information; ☹ Open communication; ☹ Commitment to sharing information;	ElecCo believes that by compressing lead times it will be better able to respond, however the emphasis placed on this means that information has to be pulled and is only gathered when needed and not readily available.

☹ - enabling ☹ - inhibiting N/A – not applicable ☹ - needs managing

Factors	Phase One	Summary of evidence
Organisation structure – intra and inter organisational team	☹ Process orientation and work flow structure plus inter-firm; Functional orientation; ☺ Cross functional teams	ElecCo is functionally orientated but successfully uses temporary cross-functional teams occasionally.
Management methods	☹ Manufacturing flow – aligned to customer demands; ☹ Production control methods aligned with business drivers; ☹ Synchronisation of management and workforce; ☹ Level of complementary philosophies; ☹ Supportive / participative management; ☹ Leadership; ☹ Coercive power; ☹ Trust	ElecCo's reactive approach has led to mismatches of production control methods with customer demands and business drivers. Its manufacturing flow is a result of Group-wide strategy rather than one suitable to ElecCo; although quite a flat structure there is little synchronisation of management and its reactive workforce. Due to recent change in leadership there was a lack in strategic direction and employees below Level Three feared loss of their jobs and were reluctant to express an opinion.
Culture and attitudes	☺ Internal competition; ☺ Continuous improvement; ☹ Joint terminology; ☹ Cooperative	It was generally accepted and supported across ElecCo that it was an engineering led organisation (also Table 6-7) and they were keen to improve their performance at next development cycle. However terminology between engineering, operations and suppliers often inhibited response and the isolated approach to functional management often meant less cooperation to resolve issues.

Factors	Phase One	Summary of evidence
<i>Shared goals, resources and benefits</i>	⊗ Incentives to remain aligned; ⊗ individual goals; ⊗ Conflicting goals; ⊗ Shared risks; ⊗ Shared rewards	The incentives system was based on individuals / functions achieving set goals but some of these goals were conflicting. For e.g. CM would over promise the customer to achieve sales but this sometimes had impact on shareholder value and customer value as it could require a redesign and tight time scales at an already fixed price.
<i>Performance measurement</i>	⊗ Decision making capability; ☺ Joint problem solving; ⊗ Joint level of using performance measures; ⊗ Joint target setting	ElecCo was not dependent on its BPMS for decision making. A reactive approach is taken to resolve issues as they arise and it uses a 'war room' to address these. ElecCo has disjointed performance systems with little shared targets.
<i>Difficulty in executing new strategies</i>	n/a Strategy formulation; ⊗ Decision-making capability; ⊗ Stakeholder involvement; ⊗ Strategy deployment process	Group has a strong influence on ElecCo and prescribes expected achievements as well as Group's strategy to ElecCo using a 'one size fits all' strategy; Little involvement of stakeholders in its deployment process and strategy is not deployed to all levels.
Understanding and identifying appropriate customer segments	⊗ Variable identifiable and measurable; ⊗ Relevant to purchase of product and buyer behaviour; ⊗ Sufficient size for adequate return; ⊗ Accessible through available marketing channels	ElecCo's approach to segmentation is MCo versus all other customers. Whilst MCo is a key account taking such an approach has meant that it has tried to serve all its customers using a supply chain / products that have been designed principally for MCo leaving neither segments satisfied.

☺ - enabling ⊗ - inhibiting N/A – not applicable ⊕ - needs managing

6.4. Competitive and Strategic Response (Retrospective Look)

Using the market responsiveness model to view ElecCo has highlighted a number of gaps in its responsiveness that are reviewed retrospectively in this section to further enhance the understanding of the underlying mechanisms associated with delivering appropriate response.

In this case ElecCo appears to be moving into a more matured stage in the lifecycle of the sector as customers are beginning to push for more cost-effective solutions (**Section 6.2.1**), but it does not seem to recognise it (**Table 6-7**). ElecCo still believed that it could compete on the basis of its core-competence. In the past this has been the case whereby the company that came up with the best technology got the order and could command a premium price. However ElecCo's major competitor had derived a cost-effective approach to win market share from ElecCo by evolving its designs by re-using existing parts where possible rather than coming up with completely new designs (**Table 6-5**); this meant cost-effective operations and as a result of its success it started to build on customer intimacy leaving ElecCo behind. ElecCo's complacency as market leader (niche position with no real competition) perhaps had an input to its viewing the market as being static as it believed that by coming up with the best product would give it market leadership again. Under pressure to deliver maximum shareholder value coupled with its reactive approach meant that ElecCo had a short term orientation to creating shareholder value as it was not uncommon to downsize every quarter.

A key gap in ElecCo's strategy flow was its lack of market strategy (although in definition) as it essentially stemmed the design of operations. Essentially there were two segments; one was technology driven and was ahead whilst the other had tight margins and wanted cheaper equipment. ElecCo's lack of differentiation and its subsequent 'one solution fits all' strategy and supply chain processes meant that neither segments were satisfied and hence loss in both shareholder value and customer value.

The current organisation setting of ElecCo relative to its market segments meant that its unit of analysis did not align with its value proposition. This also meant that there was a

misalignment between its performance system and these segments. In the case of ElecCo layout constraints and size of the facilities was such that it was deemed best to organise around functional teams. Globally located sales force, customers and Group contacts also added to the difficulty of aligning its organisational setting to the market segments. However with the nature of ElecCo's setting (functional layouts, functional teams and isolated globally located groups) with its predominantly informal reporting process between the groups meant value was being lost.

A major inhibitor to the implementation of a revised BPMS within ElecCo was its functionally fragmented nature that has influenced the culture and sub-cultures within the organisation. This was such that there were perceptions within the organisation about certain functional groups being more important and the manner in which targets were set gave little incentives for these functions to work closer together. This also had an impact on ElecCo's strategic direction as when interviewed, there was misalignment in the SMT's view of the organisation's core competence (**Table 6-7**). Also management preferred metrics to be focussed on one individual or group because it was easier to manage as it would provide accountability. In the case of material cost to revenue, although it was a shared target between Engineering and Operations, Operations were held accountable and were rewarded for it. Engineering, despite their tendency to over-design and use expensive materials, had little incentive to help meet the target.

A key inhibitor to ElecCo aligning with its customers is Group. Group measures are directed towards shareholder value and this detracted ElecCo from the customer. The effects of frequent downsizing had an impact on the trust of management by staff and it was hard to win back such highly skilled staff when they were required. Also frequent changes in management within Group (job rotation) also brought in new policies (i.e. outsource or not?) that were not necessarily suitable to ElecCo. The SMT believed that outsourcing a large part of their manufacturing function meant that they could control downsizing better; improve cycle times and reduce costs. They also believed that it allowed them to focus on their core competence of design and become a virtual organisation. However this also meant a more fragmented structure that called for strong internal supply chain capabilities

for it to be successful. The fragmented structure was also further complicated by the rationalisation of its supply base (**Section 6.2.2.1**). ElecCo had moved from smaller, flexible suppliers that they had had partnerships with for years to large ones that were unfamiliar with the business and who considered ElecCo a small proportion of their business. The added complexity of the products and frequent engineering change orders (ECOs) meant that they found it difficult to deliver the cost savings and their geographical distance further complicated the matter. It seems that ElecCo was following 'best practice' supplier management but it is clear from its context that such practices are unsuitable to its ability to respond to shareholder and customer needs.

Overall ElecCo was an organisation in a constant state of flux and this made it difficult for them to understand the impact of their changes to their supply chain.

6.4.1. Theory Building from ElecCo

Lessons learnt from the critique of ElecCo via the responsiveness model highlight some theoretical proposals that described in the following paragraphs.

- Prahalad and Hamel (1990) prescribe three conditions that core competence must meet. These are a) it should provide potential access to a wide variety of markets; b) it should make significant contribution to the perceived customer benefits of the end product; and c) it should be difficult for competitors to imitate. In this case ElecCo has shown that as market needs have changed, new competencies may need to be developed in order to sustain competitiveness. Also the internal focus of core competence thinking has meant that ElecCo had lost sight of the market and opportunities to develop new competencies that will keep it competitive.
- From **Table 6-5**, competitive options left to ElecCo are to pursue operations excellence / customer intimacy but Treacy & Wiersema's model has proved insufficient in this case as such differentiations do not only apply to product profiles but also service profiles too. It also highlights and supports Hill's order qualifiers and order winners. Whilst some researchers have argued that operations excellence is a prerequisite for any competitive pursuit, it stands in this case that the order qualifier or base performance is

product innovation whilst the order winner could fall under operations excellence (or cost) or customer intimacy.

- Integrative nature of the BPMS framework has been shown in this case to be a key desired quality of an enabling BPMS. Although it is argued that approaches such as monitoring supplier performance and customer scorecards are integrating performance across multiple organisations (Lambert and Pohlen, 2001) it has been found in this case that such approaches are internally focused and unidirectional. A more cooperative approach could involve having these stakeholders agree a data collection point, a shared metric and a custodian for the process. Therefore having each stakeholder represented or involved in the process at interfaces that exist within the organisational and supply chain is important for alignment as buy in from the stakeholder is necessary for the BPMS to be integrative. This means that an organisation will need to optimise its structure and settings such that ownership levels and accountability designed in a manner that coordinates decisions, actions and behaviours to maximise both shareholder and customer values. However, as in this case, organisations may be restricted by their layout constraints. This led to a finding (**Figure 6-6**) that teams that are co-located and cross-functional may predominantly use an informal reporting process to align as the nature of the setting allows it to do so. On the other hand, teams that are fragmented due to their layouts, location or functional orientation need to apply more effort by using a formal reporting process to ensure that they are always aligned.
- The tendency of Group to promote the same financial targets for all operating companies may not be appropriate for all operating companies. Frequent changes in management can lead to loss in shareholder value as they often lead to changes in policies that are distorted as they are translated through the organisation and the supply chain.
- Outsourcing requires clear objectives. In this case supplier management became more intensive and configuration changes more complicated. Operations were focused on the cost savings expected from it but the loss in visibility of suppliers (from tier one to tier two) meant less access to costed bill of materials, difficult quality control and risk of multiple mark-ups from tier 2 and OEM suppliers. Such negative aspects may be

acceptable if the redesign was in line with customer segments but this was not the case and as such there was loss in both shareholder value and customer value.

- This case also supported the proposed concept of ‘value execution point’ (VEP) and in this case the VEP lies within the Engineering function. This because from the point where customer specifications are received, Engineering’s response and design changes determines the complexity of the subsequent supply chain activities of getting the product to the customer in a manner that delivers customer value and shareholder value.

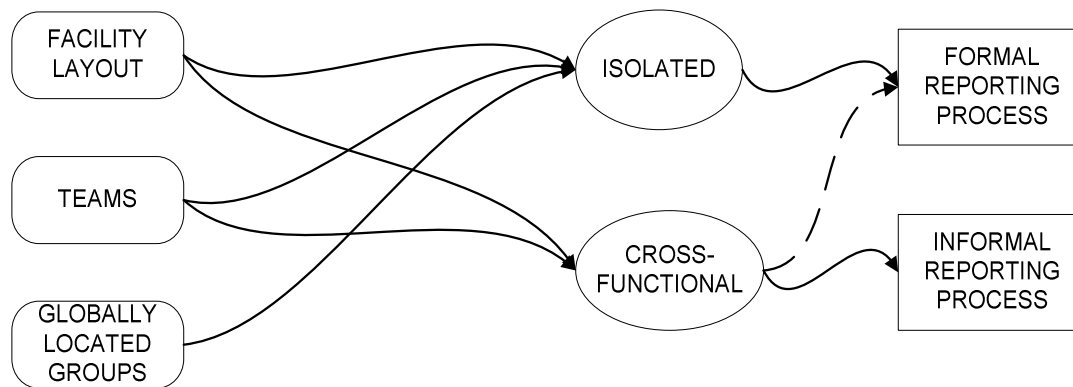


Figure 6-6: Theory building from ElecCo

6.5. Conclusions: Discussion and Summary of findings

This case has shown how the responsiveness framework can be used to view an organisation to highlight gaps in creating value to customers and shareholders. Taking a very critical stance of this supply chain it has also made it possible to recognise what enables an integrative performance management system and what inhibits it. These factors include understanding and identifying appropriate market segments to establish an appropriate unit of analysis; Aligning the design of the organisation (layout, location, teams, processes – strategy deployment & supply chain processes and hierarchical structures – ownership & accountability levels) with its market segments and buy-in from the stakeholders at every stage of the process considering the incentives, perceptions and mechanisms that would encourage these different groups to work together to create appropriate response.

The length of study allowed in depth analysis of a particular situation and the data collection was limited to the business-to-business context of a high variety/ low volume firm that was expected to be market-led but was not. Hence, the generalisability of the study is limited to similar settings. These limitations should be considered when interpreting the results.

CHAPTER 7.

Case Study Two: Applying Framework to AutoCo

The purpose of *Chapter 7: Case Study Two* is to:

- To present the findings from applying the framework to AutoCo.
- Establish aspects of the model that can be enhanced.
- Establish feasibility of implementing such a model within a context that is similar to AutoCo.

7.1. Background to AutoCo

AutoCo is a European based operating company of a global automotive supplier. AutoCo is characterised by medium volume/ medium variety production of seat components and these products are targeted to the niche segment of premium cars in the automotive industry. **Table 7-1** provides a summary of background data on AutoCo.

Table 7-1: Background to AutoCo

Dimension	Data
Part of Group	Yes
Contribution to Group sales revenue (%)	17%
Sales Turnover (£)	25 million
Net Profit (£)	< 15%
Investment in R&D	7% group wide
No. Employees (Direct and long term contract)	170 directs up to 250 indirect
Location	Global
Output / year (units)	1 million
Average no. parts / unit	54
No. customers	>50
No. suppliers	<80

Table 7-2: Focal organisation interviews at AutoCo

	Senior Management (Level 1)	Middle Management (Level 2)	Functional (Level 3)	Total
NPD		1		1
Finance & HR		2	1	3
General (Level 1)	2			2
Supply Chain		1	2	3
Marketing		2		2
Manufacturing		1		1
Total	2	7	3	12
Total hours	14.5	13.5	3	31

Table 7-3: Inter-organisation interviews

	Parts Suppliers	Focal organisation	Customers	Outsource 'Deliver'	Total	Total hours
No. Companies	2	1	2	1	6	41
No. Interviews	2	12	3	1	18	

7.2. Firm Orientation

As part of a group, AutoCo as a business unit has been set financial objectives that are measured by EBIT and gross margin contribution. AutoCo's recent acquisition has meant that it has moved from being an organisation privately owned by its management to one that is floated on the stock exchange. This has brought about recent changes to the way the business is managed and a new focus of primarily delivering shareholder value. **Table 7-4** represents the value proposition relating to the stakeholders of AutoCo.

Table 7-4: Stakeholder proposition at AutoCo

Key stakeholders	Value proposition
<i>Shareholder</i>	Maximise shareholder value. Measures include ROCE, EBIT and net operating cash flow from operations.
<i>Customers</i>	Frequent and reliable delivery; Year on year cost reduction; high and consistent product quality.
<i>Employees</i>	Group has a strategy for manufacturing in lower cost countries; more money, Continuity of employment; Morale improvement
<i>Suppliers</i>	Continuity of business
<i>Government/ Legislative /Community</i>	EU directive, recycling, health and safety. Continuity of employment;

7.2.1. Scope, Competitive Context and Market Drivers

An existing paradigm within the organisation was that “*all customers’ needs are the same*” and as such the study was scoped around two customers of distinctive demand patterns. These were the Jaguar supply chain (**Figure 7-1**) and the BMW supply chain (**Figure 7-2**). The scope was further narrowed to the two specific products that typify the buying behaviour of the respective Tier One customers in these supply chains.

The automotive industry is distinguished by long-term relationships between supply chain entities and these entities are typically integrated. The following describes some of the market drivers stimulating the competitive environment of the premium segment of the automotive industry.

End user demand: In the premium car segment the brand is as important as comfort and performance and it provides a competitive edge. Brand value for vehicles in the premium market is based on emotional appeal, uncompromised engineering, innovative technology and outstanding quality. It is further enhanced through confirmed repeated experience.

Developed countries, particularly Europe and USA, are the largest markets for premium vehicles, but these markets are already saturated. End user demand (in volume) for new cars has shrunk by 0.3% in 2005 in Europe while it has grown in the US by 0.5%. Performance of the market is forecast to grow but at a very slow rate. To add to this, substitutes exist in the form of used cars and economy models that are becoming increasingly sophisticated and are available throughout the automotive price spectrum. This in combination with low end user switching costs means that vehicle manufacturers (VMs) in the premium segment have to offer a large product variety such as seat types, new models, engine types, etc to differentiate their products in such a saturated and shrinking market. They have also resorted to using dealer services as a means to differentiate and to lock existing customers to their brands. Hence most VMs in this sector of the market have high brand loyalty and try to lock in their customers early with entry level premium cars in order to survive over a long term.

Vehicle Manufacturers: In the premium segment price is not an important issue as styling, comfort and performance are. This has led to increasing competition from Japanese car manufacturers, particularly Toyota and Honda who have historically been focused on mass markets. These manufacturers are now increasingly moving into the premium side of the market and developing competences in styling and comfort meaning a decline in revenue realisation per unit for existing players like BMW and Jaguar. Such adoption of new competences by these traditionally economy model VMs can contribute to diminishing the brand image of luxury cars. This may be why BMW invested in a brand academy to help strengthen its brands whilst Jaguar introduced an entry level car to its range as concentration in one niche of the premium segment is likely to lower revenue growth. However, in its endeavour, Jaguar faced questionable quality, performance and reliability issues owing to shared attributes and components with Ford (its owner). This meant that it lost some of its brand individuality that led to brand deterioration. Further it advertised incentives due to poor sales that added to deteriorating the brand as its heavy discounts to meet exaggerated sales targets attracted price conscious buyers unlikely to move into high end thus upsetting its existing customers. BMW on the other hand has

focused on ongoing efficiency improvement measures and using its strong brand equity with no quality issues to increase in sales volumes.

Both BMW and Jaguar produce vehicles in Europe to sell in the US and as a result have experienced margin pressures due to the depreciation of US dollar to major currencies since 2002. Currency fluctuations coupled with high crude oil prices have increased polymer prices - plastic materials are used extensively in the automotive industry; and further pushed End Users into lower priced segments due to fuel mileage.

Legislation & external influences: There are some few constraints concerning the drive of government and pressure groups greener and environmentally friendly methods. Also there are legislative constraints on safety.

Development in technology: Technological innovations are constantly taking place in the automotive industry making substitute components that can take the place of AutoCo products plausible.

Costs and profits: Efficiency pressures on VMs are being passed up the supply chain to automotive suppliers. VMs have outsourced sub-assemblies to Tier Ones so as to minimise the number of suppliers they deal with and focus on delivering brand values to their customers. As a result Tier Ones have become quite powerful and due to the availability of plentiful suppliers, substitutes for most automotive components are typically available.

Switching costs for Tier Ones are not high as their suppliers pose no credible threat of forward integration. Also the reduction in trade barriers and globalisation have increased sourcing options further threatening bargaining power of suppliers like AutoCo. For these reasons Tier Ones are able to dictate year on year price discounts coupled with uncompromised quality, reliable and frequent delivery from their suppliers. The bidding wars that result from this have turned most automotive components into commodities.

People: AutoCo is geographically located in a high cost country. A key challenge for AutoCo is getting skilled staff and being able to manufacture at competitive rates especially as the policy of its new ownership is to move manufacturing from high cost countries to lower cost countries.

As a result of these market drivers AutoCo's competitiveness is stemmed on developing unique products in specialised market segments such that good margins can be obtained for shareholders. **Table 7-5** shows how AutoCo's competitiveness compares with that of its main competitor. The nature of the business is such that suppliers like AutoCo bid to supply their seat systems to upcoming car models. Winning the bid gives them a contract for the duration of the production of that model. When a new bid comes out, their performance on a previous bid is used to judge their capability to have another contract.

Table 7-5: AutoCo's competitiveness

STRATEGY	CURRENT STRENGTHS	
	AutoCo	Main Competitor
OPERATIONS EXCELLENCE	✓ Experience curve means increased productivity	✓ Longer experience in the industry & existing market leader
PRODUCT LEADERSHIP	✓ Captured the market with innovative product using new technology	✓ Playing catch up on AutoCo's technology
CUSTOMER INTIMACY	✓ Building up relationship with both Tier One and Tier Two	✓ Existing long-term relationship with Tier One

7.2.2. Strategy Flow

AutoCo has a fixed annual strategy deployment process that starts with strategic discussions at group level that leads to ambitious sales targets for the next five years. These targets are communicated to divisional heads who communicate them to their respective plant directors. They decide together how to meet these targets. Decisions are made at this level about expanding or contracting operations and how to resource operations to meet the targets. Following this they define first year local investments by factory that is approved by group then each plant director takes one year statements to their factory to present what the factory needs to achieve in the following 12 months. At factory level of the deployment process critical success factors (CSFs) are deployed to functional areas and measures are derived for each CSF. Targets are set for each functional area with action plans for individuals. **Table 7-6** describes elements of AutoCo's strategy.

Table 7-6: Strategy flow at AutoCo

Strategy Levels	Characteristics
Business Unit Strategy	<p>This is partly driven by corporate strategy and by the existing MD's view about appropriate route to competitiveness. It is based on developing management team to achieve leading results using best practice and securing a long term future of the plant as a centre of excellence for design and manufacture.</p> <p><i>Differentiation variable: Each business unit is specialised to a sector of the industry</i></p>
Market strategy	<p>Aim to win all product bids that have been put out. Develop intimacy with both Tier One and VMs. Pre-empt customer needs and bring in new business. Decision variables: customer needs, cost – aim to use exiting products with different configuration.</p> <p><i>Differentiation variable: car model, VM account; geographical locations.</i></p>
Supply chain strategy	<p>Based on “<i>all customer needs are the same</i>” they have employed a lean strategy as the belief was that “<i>all demand is flat</i>”. Use similar approach as Tier One to its suppliers (year on year discounts, delivery frequency, etc) Decision variables: KANBAN levels <i>Differentiation variable: None. Forward transport differentiated by geographical destination.</i></p>
Manufacturing Strategy	<p>Implement a culture of waste elimination use KANBAN.</p> <p>Decision variables: capacity utilisation, efficiency, cost reduction, waste elimination <i>Differentiation variable: volume based value streams; manufacturing cells; machine efficiency</i></p>
Product strategy	<p>Ability to launch product and equipment successfully. Decision variables: timely launch, cost effective, innovative product, quality. <i>Differentiation variable: SKU - modified/ new products for VM models as specified.</i></p>

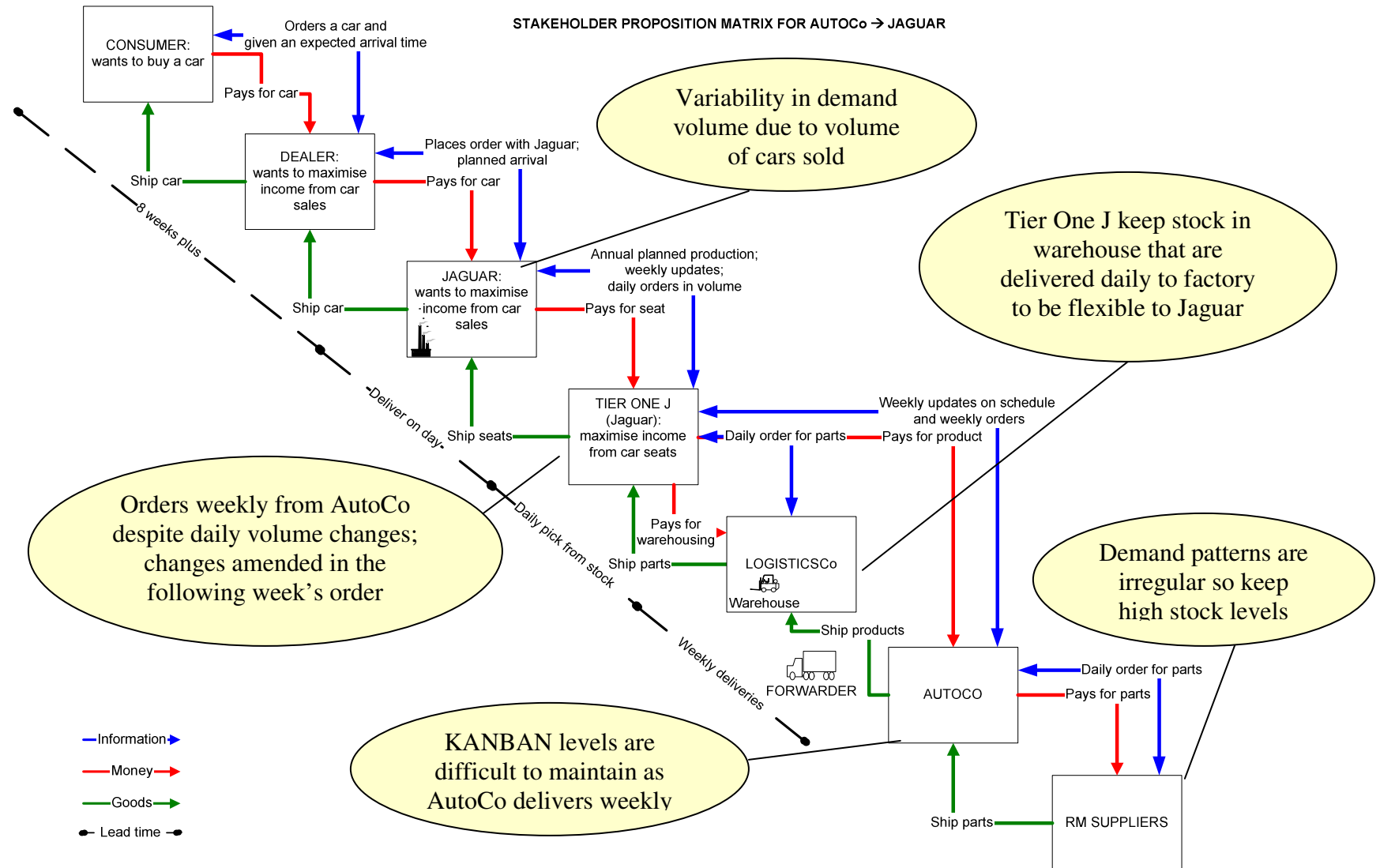


Figure 7-1: AutoCo to Jaguar supply chain

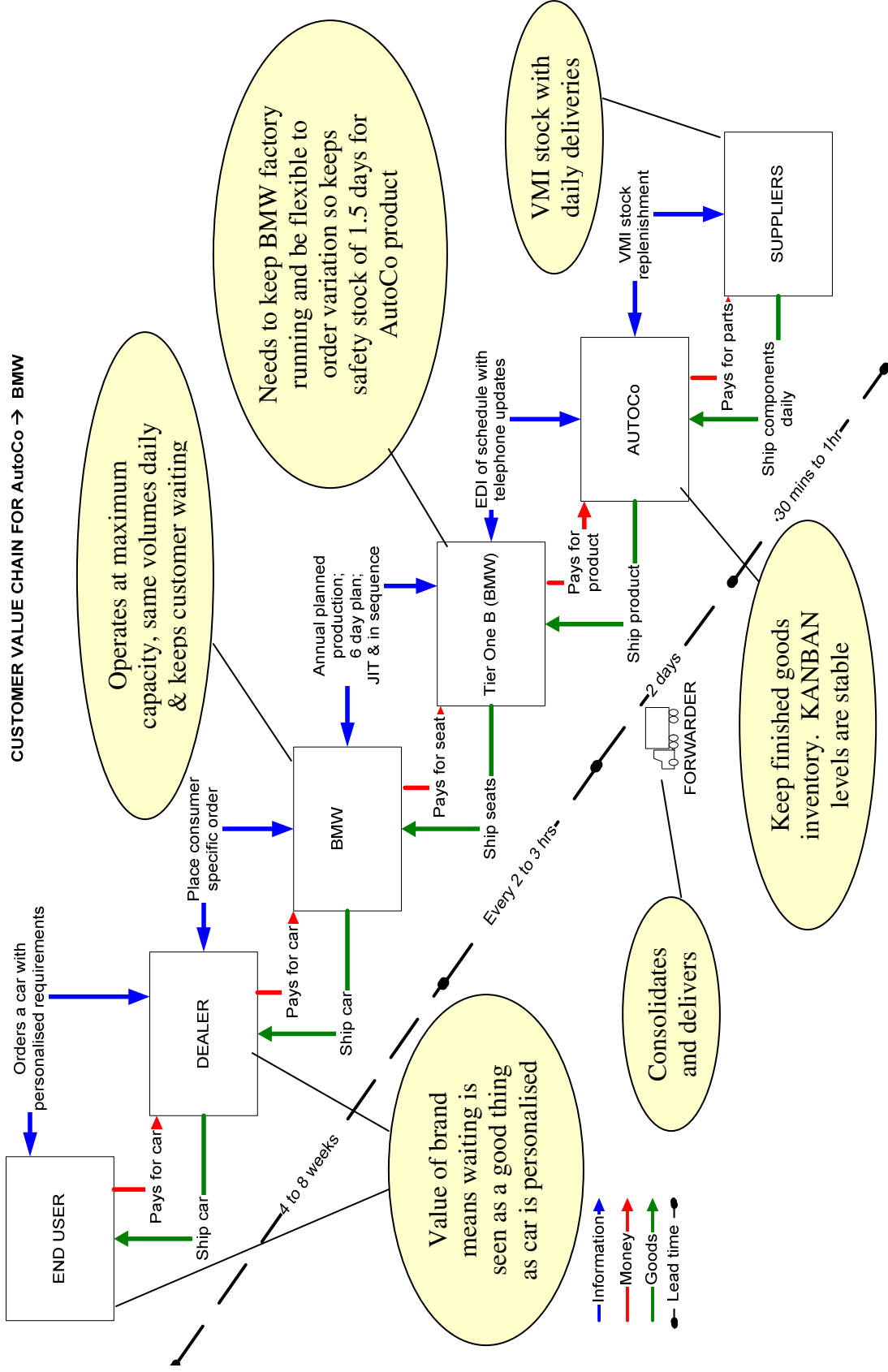


Figure 7-2: AutoCo to BMW supply chain

Examining both the supply chains of Jaguar and BMW reveals that all customers' needs are not the same. Jaguar's variability occurs at the VM. Jaguar operates below its maximum capacity (**Figure 7-3**) and this means that it has to vary its production according to the volume of cars sold against plan. Therefore weekly to daily updates are sent to Tier One J who makes the seats hours before the car goes into production. Tier One J keeps stock at its warehouse to enable it to be flexible to Jaguar's volume fluctuations. Tier One J attempts to level the schedule with AutoCo. They send AutoCo an order at the beginning of the week and do not change the orders despite daily updates from Jaguar. Rather they make amends for these variations in volume by taking it out of the following week's order to minimise stock at the warehouse. As a result, the volume fluctuations AutoCo receive is found on **Figure 7-4** and this makes KANBAN levels difficult to set at AutoCo. Since order units vary from 10 to 270, sometimes KANBAN stocks are not enough to meet an order and sometimes too high and takes up costly space in AutoCo's FG store for months.

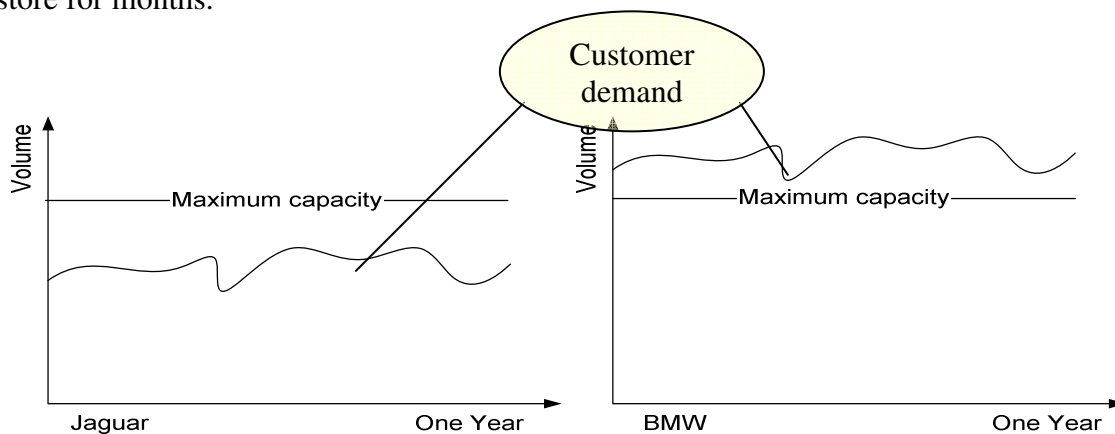


Figure 7-3: Demand patterns at VMs

BMW on the other hand is set up to operate at maximum capacity while its demand exceeds capacity. Its brand value is such that the customer is convinced to wait for the product as it is customised to their requirements. This way, production volumes do not fluctuate and orders can be smoothed across its supply chain to maximise efficiency. Also variability is minimised by scheduling similar orders together. Tier One B is tasked with helping to keep BMW's assembly line running by producing the seats just-in-time and in sequence and they deliver them every two to three hours. However the fitment of an AutoCo product is not

standard fit (**Table 7-7**) and so Tier One B has to be flexible to be able to add this form of variety to their standard seat product. Tier One B gets a sequence plan six days in advance which enables it to book special orders two to three days in advance to get an AutoCo product and they kept a safety stock of 1.5 days. However it emerged that whilst AutoCo believed that it was delivering to Tier One B daily, Tier One B was actually receiving the products every two/ three days. This was because the Forwarder was consolidating the delivery. These factors added to the volume fluctuations in demand from Tier One to AutoCo (**Figure 7-5**). Nevertheless the stability of BMW's supply chain meant that AutoCo could set KANBAN levels and use its lean setting to respond to customer needs.

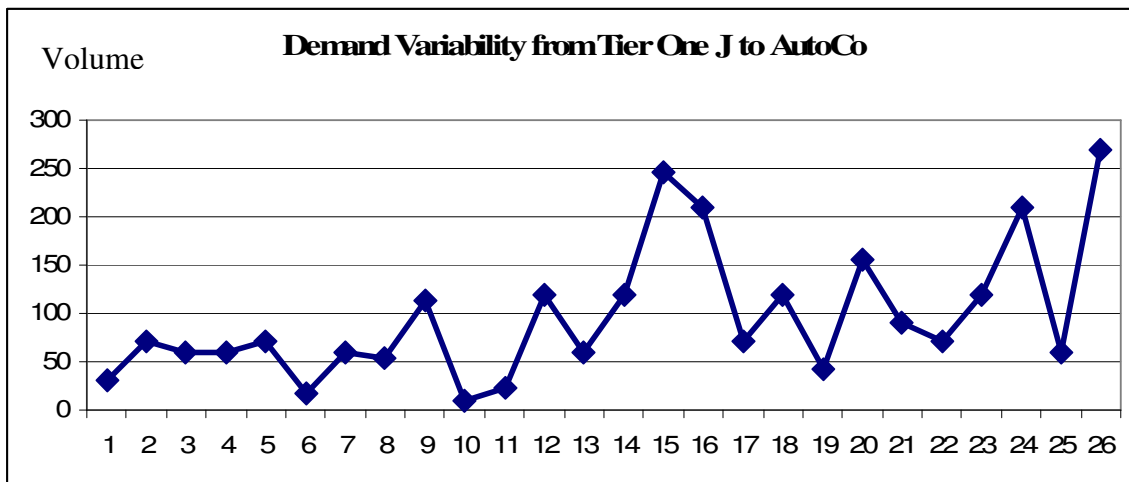


Figure 7-4: Jaguar demand volume fluctuations for AutoCo over 26 weeks

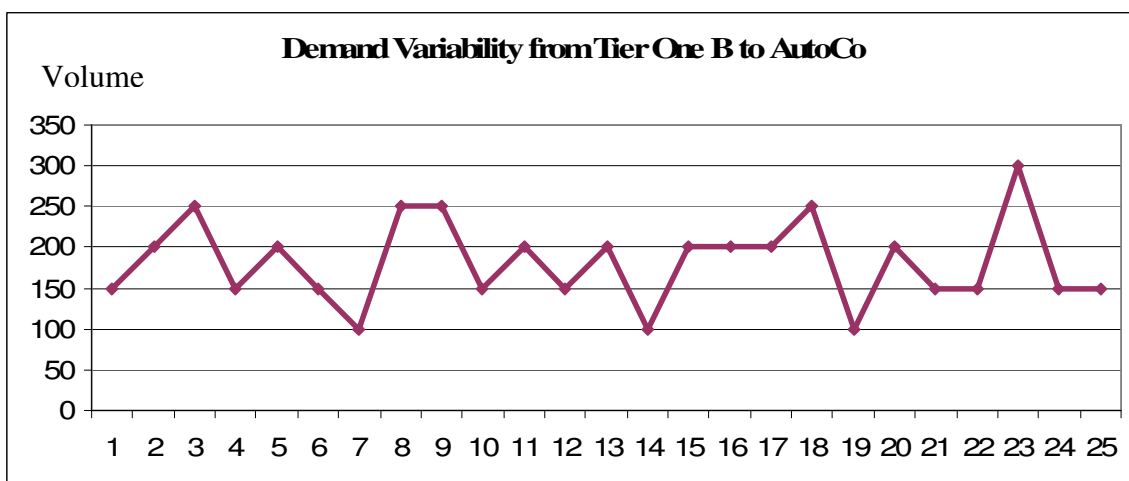


Figure 7-5: BMW demand volume fluctuations for AutoCo over 26 weeks

Table 7-7 and the supply chain maps examine the root causes of the differentiated response type implied by each supply chain.

Table 7-7: Comparing influences in Jagaur and BWM's supply chain for AutoCo

		BMW 3 series	Jaguar X Type
Brand Value and performance	Price	£20,720 to £36,110	From £19,000 to £29,005
	Engine size	2.0 L to 3.0 L	2.0 L D to 3.0 L
	Horsepower	129 to 306	128 to 231
	Speed (0 to 60)	10 to 5.6	9.5 to 6.6
	Drive	Optional	All wheel drive
Product attributes/ response	AutoCo Seat	Not standard	As standard
	Variability point	At dealership	At Jaguar
	Delivery	Daily to Tier One	Weekly to Tier One
	Volume/ predictability	Unstable / Predictable	Unstable/ Unpredictable
	Response type implied	Hybrid e.g. base/surge, lean, JIT	Agile

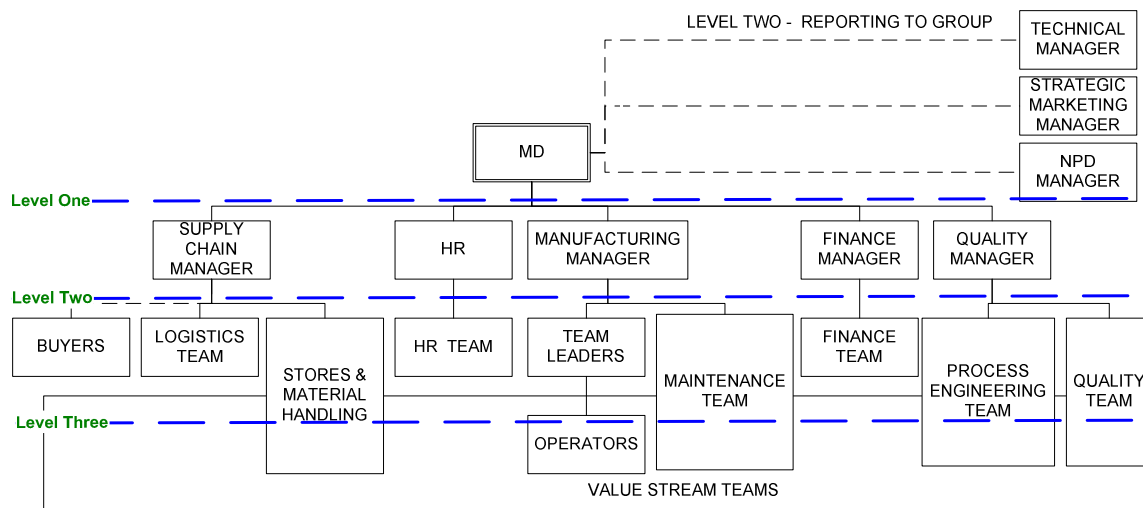


Figure 7-6: Summarised organisation chart of AutoCo

Value gaps identified are summarised on **Table 7-8**.

Table 7-8: Value gaps at AutoCo

Value gaps	Description
Hierarchical	<ul style="list-style-type: none"> AutoCo's organisational structure is fairly flat and well integrated. The only complications are the dotted reporting lines.
Functional	<ul style="list-style-type: none"> The dotted line employees are representative of group strategic functions and on a day to day basis have nothing to do with operations. Beyond Level Three (Figure 6-3) the teams are merged into value stream teams and there are two value streams.
Layout	<ul style="list-style-type: none"> The physical layout was such that operational functions such as supply chain and manufacturing were co-located in an open plan space with the Managing Director's office next door. Whereas the other functions were located separately further stressing the gap between dotted line functions and solid line functions. Dotted line functions are located on different floor to operations.
Financial	<ul style="list-style-type: none"> AutoCo is a profit centre. The operations team is a cost centre and the dotted line functions are each cost centres.
Process disconnects	<ul style="list-style-type: none"> The two values streams are split arbitrarily. Founded on the belief that "<i>all customer needs are the same</i>" and so the split was mainly to do with balancing volume of work between the teams. There was also a process gap in the launch of new products from design to production as costs are guesstimated quoted to customers to win the bid for a new product contract.
Organisational	<ul style="list-style-type: none"> "<i>All customer needs are the same</i>" Order tracking is not possible between AutoCo and Tier One B AutoCo treats its suppliers in the same way that Tier Ones treat them i.e. year on year discounts, supplier rating and continuous improvement. The new owners are tending to drive AutoCo towards commodity.

7.3. BPMS Framework

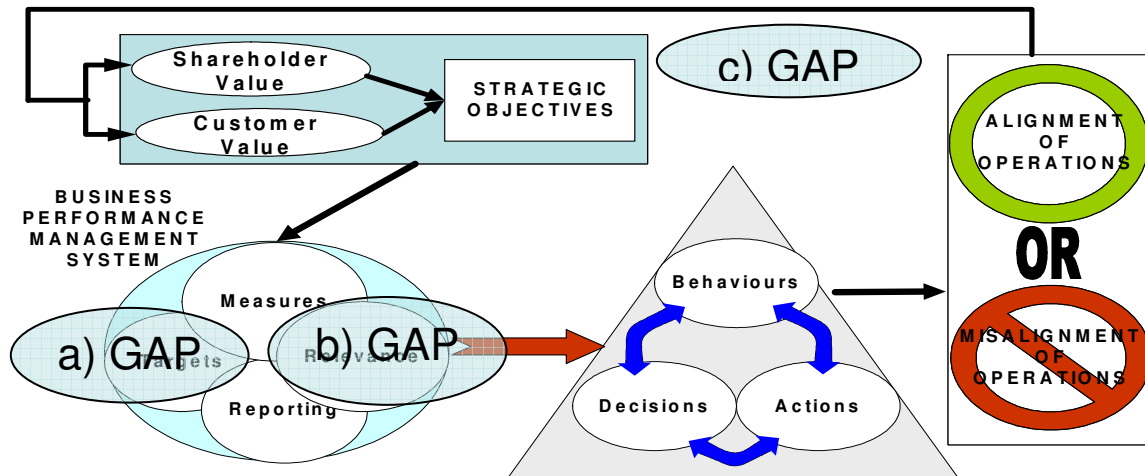


Figure 7-7: BPMS alignment at AutoCo

The following alignment gaps were highlighted:

- a) AutoCo has an excellent deployment process. All staff interviewed understood the strategy, the strategic process and had CSFs that were linked to it. These CSFs were converted to measures of which targets were set. AutoCo had a belief that “*targets must be within a job owner’s control*” and so deployed the targets functionally across Level Two. For example the supply chain manager was tasked with minimising stock levels and this measure can be impacted upon by volume of sales and over-production (as production wants to maximise its productivity) and these factors are not entirely within the function’s control. **Table 7-9** summarises the BPMS at AutoCo. The implications of this were that measures were limited to functions and reviewed within those functions. Also at cross-functional reviews it led to blame. It was also highlighted in the CSFs to develop excellent problem solving skills. Interestingly Quality’s target was shared across all functions and it worked well yet it was not accepted that other targets could be shared.
- b) As examined in the previous section the “*all customer needs are the same*” paradigm at AutoCo proved to be a “one size fits all” approach. As a result the same targets were being used for different customer needs. This was made evident by the fact that production was frequently reporting productivities that were as high as 250% as standard time settings were not related to the products.

c) There was a gap in the deployment process along the lines of ensuring that the developed CSFs do deliver the strategic intent of the organisation. However AutoCo's BPMS is reviewed annually as part of the strategic process to ensure that all measures are linked to the CSFs.

Table 7-9: BPMS at AutoCo

	CSF/ Targets	Metrics	Reporting	Relevance
Finance	Maximise shareholder value	Cost of quality, EBITA, Cash flow from operations	Daily to weekly to monthly	Shareholder
Quality	Embed zero defect thinking	PPM customer PPM supplier	Weekly to monthly	Shareholder /Customer
Marketing	Grow sales & build intimacy with customers	Planned wins, Sales target, Customer scorecards	Weekly to monthly	Shareholder /Customer
HR	Implement a reward system	Appraisal, safety Accidents, Absence	Weekly to monthly	Employee
NPD	Successful launch of new products	Under development – considers timely, cost & quality	Project based	Gap
Supply chain	Minimise stock levels & improve customer service	Delivery performance Inventory turnover	Weekly to monthly	Customer Shareholder
Manufacturing	Waste elimination	Productivity, OEE	Daily/weekly/ monthly	Shareholder
Suppliers	Delivery performance 100%, Annual savings 3% - 5%, Quality 25 PPM		Monthly	N/A
Customers	Annual savings 5% , Price, quality, delivery & reliability		Monthly scorecard	N/A

Table 7-10: Implementation factors at AutoCo

Factors	Incentives	Perceptions	Mechanisms	Example
Internal competition	N/A	N/A	☺	Functional targets
Misaligned target setting	☺	☺	☺	Plan to introduce reward mechanisms. Functionally and individually set targets and belief that it is fine the way it is despite conflicts between production and NPD.
Fragmentation of ownership	☺	☺	☺	Little incentives for groups to work together to improve targets This is not my role. Strategic & operational split.
Understanding & identifying appropriate customer segments	N/A	☺	☺	One size fits all approach, all customer needs are the same.
Organisation structure and design	N/A	N/A	☺	Fairly flat structure
Difficulty in executing new strategies	N/A	☺	☺	Perception that implementing new ideas are difficult. Lack of skills – issue raised by top management
Demand Uncertainty	N/A	N/A	☺	Trying to use same solution, same targets across the supply chain

Table 7-11: Enablers and Inhibitors to responsiveness at AutoCo

Factors	Phase One	Summary of evidence
Demand uncertainty & variability	☹ Ability to recognise / anticipate demand; ☹ Joint level of planning; ☹ Management of product variety; ☹ Cooperation to develop new products	The 'one size fits all' approach by AutoCo to all customers distorted effective planning. The dotted line position of NPD left it misaligned with operations at AutoCo.
Supply chain flexibility	☹ Buffers; ☹ Inventory levels	AutoCo's Lean / KANBAN approach to all customer needs meant that it was less flexible in its set-up and this often led to high costs when it had to induce flexibility such as additional shifts, freight costs to meet customer needs.
Integration of information systems, functions and organisations	☹ Integration of functions ☹ Integration of information systems N/A Integration of organisations	The operations integrated setting enabled them to work as one function. EDI was an enabler but it was not used to its full advantage. Internally all performance systems were reported on one system giving everyone visibility.
Timely flow of goods and information	☹ Lead time compression; ☹ Demand transparency; ☹ Timely information; ☹ Relevant and accurate information; ☹ Open communication; ☹ Commitment to sharing information;	Taking advantage of the short lead times between the supply chain entities described in this case enables better response. Demand transparency is available in the form of EDI but at the time of study these were not in use as the data was not the most up-to-date. Communicating specifically with customers about these issues helped to alleviate it.

Factors	Phase One	Summary of evidence
Organisation structure – intra and inter organisational team	☺ Process orientation and work flow structure plus inter-firm; Functional orientation; ☺ Cross functional teams	AutoCo is a model organisation with its value stream setting and co-location of cross-functional teams. This means that less value is lost due to isolation.
Management methods	☺ Manufacturing flow – aligned to customer demands; ☺ Production control methods aligned with business drivers; ☺ Synchronisation of management and workforce; ☺ Level of complementary philosophies; ☺ Supportive / participative management; ☺ Leadership; ☺ Coercive power; ☺ Trust	As examined in previous sections, AutoCo's flow was not entirely aligned to customer demands. Its control methods are strongly aligned to business needs and its flat organisation structure allows an easy synchronisation between management and workforce. It had strong leadership that was generally supportive and it layout setting and “open door” approach allowed for participation. However the occasional display of coercive power often led to mistrust both internally and inter-organisationally with both customer and suppliers.
Culture and attitudes	☺ Internal competition; ☺ Continuous improvement; ☺ Joint terminology; ☺ Cooperative	Some departments were seen as favourites. However AutoCo had a culture of continuous improvement that if managed could also encourage more cooperation between functional tasks.

Factors	Phase One	Summary of evidence
<i>Shared goals, resources and benefits</i>	☺ Incentives to remain aligned; ☺ individual goals; ☺ Conflicting goals; ☺ Shared risks; ☺ Shared rewards	AutoCo was in the process of setting up a reward system. However its current approach to target setting will inhibit responsiveness as it will encourage misalignment.
<i>Performance measurement</i>	☺ Decision making capability; ☺ Joint problem solving; ☺ Joint level of using performance measures; ☺ Joint target setting	AutoCo, in principle, has a very good BPMS set up. This case has highlighted a need for certain aspects of BPMS that need to be managed to achieve the right behaviours. These are joint target setting and standard time setting as it impacted the decision making capability of the performance system.
<i>Difficulty in executing new strategies</i>	☺ Strategy formulation; ☺ Decision-making capability; ☺ Stakeholder involvement; ☺ Strategy deployment process	AutoCo has a good deployment process that has been communicated and is well aligned through out the business. A lot of the decision making is centralised or at a senior level and this means that sometimes the decisions are not best for the plant.
<i>Understanding and identifying appropriate customer segments</i>	☺ Variable identifiable and measurable; ☺ Relevant to purchase of product and buyer behaviour; ☺ Sufficient size for adequate return; ☺ Accessible through available marketing channels	AutoCo's paradigm of "all customer needs are the same" steered a 'one size fits all' approach such that it limited the consideration for behaviours relevant to the purchase of the product.

7.4. Competitive and Strategic Response (Retrospective Look)

This case has been somewhat written back to front. It started out examining the internal strategic and supply chain processes of AutoCo and eventually it was discovered that the key differentiator between both supply chains was the strategy of the VMs. This had a major influence on AutoCo's response capability requirements and more so than in any of the other cases in this research. As a result a lot of time was spent examining the external supply chain environment of AutoCo. Internally AutoCo is well aligned, it had a strategy and it had a process but the key gap it was missing was locking its process on to the market. The back flow of behaviours from VMs had major influence on the rest of the supply chain. A supplier in such a supply chain needs to understand the basic essence of the market to be able to respond in a manner that increases the value it appropriates. Interestingly behaviours were being mimicked upstream. Some of these behaviours, though logical may not be the best approach. For example, AutoCo was mimicking Tier One behaviour when it came to supplier management. This was not the best approach with one of its suppliers, a supplier of injection moulding. This is because this supplier did not only operate in the automotive industry but in healthcare and aerospace as well. In comparison to these other industries, the automotive industry provided little margins for a lot of requirements and little volume. The high capital equipment cost and high output of the machines in such a business means that it does not warrant the high changeovers associated with an automotive customer's small daily delivery volumes. This is coupled with the year on year price reductions demanded despite increased polymer prices. Such a case indicates changing power balance of which an organisation should consider if they can afford to lose a supplier given certain market conditions. The examination of the supply chains of Jaguar and BMW exposed a mismatch in order patterns, delivery patterns and AutoCo's response. In both cases there was no flat demand and variations were sometimes injected by the supply chain and show a good example of how companies replicate responses i.e. lean when it may not necessarily be suitable to their supply chain environment. Flexibility was important and both products had different response requirements that indicated that AutoCo's value

streams needed to be respectively aligned to the response types rather than be arbitrarily split by volume.

Doing so would mean that each value stream is set process targets accordingly as the complexities of the products and volume requirements may result in different stocking policies, different delivery patterns etc to maximise value to customer and shareholder. Setting targets in this manner would encourage the right behaviours for the differentiated value streams.

Despite a high need for flexibility, it was argued in the feedback that cost was the main driver from customers. On further examination it emerged that customer needs changed from bidding, to winning to product launch and steady state. This further called for a dynamic approach to maintaining alignment with customer needs and also indicates differing performance priorities at these different stages.

In general, AutoCo had a good performance system as the weekly to monthly management report was cross-functional and reported on one system. The only issue was that they were measuring people (individual targets) and using historical data on all levels of reporting. It was not proactive but pulled by the MD. AutoCo is a good case to show that even a good BPMS needs to be managed in a certain way to ensure behavioural alignment hence stressing a need to enhance behavioural alignment aspects of the BPMS framework. The way a joint reporting process is managed could enhance joint problem solving if it makes clear the impacts individual measures each other.

It is believed that AutoCo's internal alignment made it possible to look across inter-organisational alignment as it meant less internal focus. As examined in previous sections, AutoCo's flow was not entirely aligned to the needs of its market. However its internal alignment setting makes it possible to have such external misalignments easily fixed. Its fixed business model of lean that was not the ideal for the products examined may actually be feasible for BMW due to short lead times.

7.4.1. Theory building from AutoCo

The AutoCo case has led to the building and supporting of the following theories.

- The high influence of the external supply chain environment of AutoCo means that the case supports the theory that strategic alignment needs to occur not only internally but among supply chain partners as a means to enhance responsiveness to the end consumer whilst maximising value to all entities involved in the supply chain.
- The AutoCo case is a good case to show that even with good strategy and good processes value gaps can exist due to the misalignment of strategy and processes with market needs.
- The AutoCo case supports the suggestion that internal alignment enables external alignment.
- The BPMS findings support findings from previous cases.
- The behavioural aspect of alignment is emphasised as a key attribute to enabling responsiveness.
- The nature of AutoCo's business environment indicates that customer needs are not static.
- From a supplier alignment perspective, as you go further upstream a supply chain, the power balances change and is likely to be more geared towards the raw material suppliers as there is more competition for limited resources from other industries.
- The BMW supply chain has proved to be a case where firm orientation drives supply chain behaviours – it has influenced its customers to its advantage rather than respond to their needs. This in itself raises some debates - do customers want to be influenced or be responded to? Or is BMW's approach a form of response? It has turned what could potentially be an inefficiency (i.e. customer waiting time) into a value – an emotional value. Some would argue that it could lead to lost sales but these types of customers may not necessarily want an off the shelf/ easily available car / commodity car. The wait makes them believe that their car is truly unique and personalised. This makes BMW a model supply chain that has not only aligned its business to market needs but has created a competitive edge in a saturated, mature market by aligning its brand value to its supply chain.

7.5. Conclusions: Discussion and Summary of Findings

This case with its unique business setting has shown that the responsiveness model is applicable not just internally but also in within an inter-organisational context. Compared to previous cases it has highlighted products as a viable unit of analysis for analysing supply chain response requirements. The next chapter describes the application of the responsiveness model in fast moving consumer goods.

CHAPTER 8.

Case Study Three: Applying Framework to FMCGCo

The purpose of *Chapter 8: Case Study Three* is to:

- To present the findings from applying the framework to FMCGCo.
- Establish aspects of the model that can be enhanced.
- Establish feasibility of implementing such a model within a context that is similar to FMCGCo.

8.1. Background to FMCGCo

FMCGCo is a European based operating company of a global consumer goods manufacturer. FMCGCo is characterised by high volume/ low variety production with largely predictable demand. **Table 8-1** provides a summary of background data on FMCGCo. FMCGCo Group is along established company with a very hierarchical organisational structure that has various levels of staff. The Group has various factories worldwide that have been set up to serve markets within their location. Each location also has a marketing company (Tier One), which is part of the group, which the factory is designed to supply. **Figure 8-1** depicts this value chain. FMCGCo has been set a remit as part of the Group's new operating strategy, to take advantage of excess capacities at its factories within defined geographical regions and serve markets better by providing flexibility to source from other factories within the region. Therefore this case study was scoped around FMCGCo, its factory in Region A and the Tier One customer of that factory. **Table 8-2** and **Table 8-3** summarises the interviews conducted at each organisation.

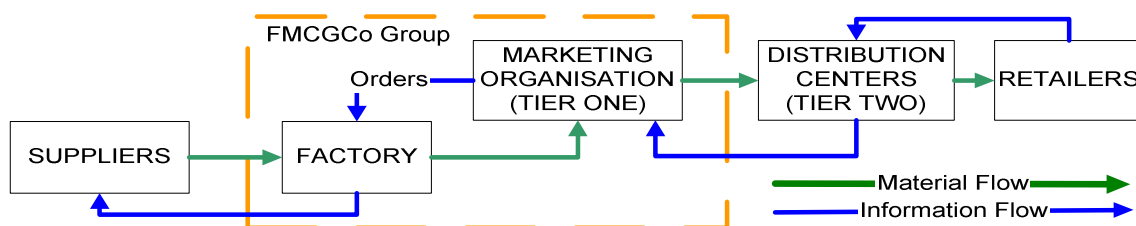


Figure 8-1: Typical supply chain in FMCGCo Group

Table 8-1: Background to FMCGCo

Dimension	Data
Part of Group	Yes
Contribution to Group sales revenue (%)	>30%
Sales Turnover (£)	3.5 billion
Net Profit (£)	< 5%
Investment in R&D	1% group wide
No. Employees (Direct and long term contract)	>1000
Location	Global
Output / year (units)	>200 billion
Average no. parts / unit	30
No. customers	Tier 1 <10; Tier 2 > 10,000s
No. suppliers	< 50

Table 8-2: Focal organisation interviews at FMCGCo

	Senior Management (Level 2)	Middle Management (Level 3)	Functional (Level 4)	Total
NPD	1	1		2
Finance & IT	2			2
General (Level 1)	1			1
Supply Manager	1		1	2
Logistics	1			1
Demand Manager	1			1
Manufacturing	1			1
Total	8	1	1	10
Total hours	19.5	2	2	23.5

Table 8-3: Inter-organisation interviews

	Group	Factory	Focal organisation	Customer Tier 1	Total	Total hours
No. Companies	1	1	1	1	4	74.5
No. Interviews	2	12	10	12	36	

8.2. Firm Orientation

The Group is floated on the stock exchange and its aim is to provide its shareholders with long term value through increased share price and dividend payments. To achieve this, the Group aims to engage key stakeholders in its respective community. As a result the value proposition of FMCGCo to its stakeholders is listed on **Table 8-4**.

Table 8-4: Stakeholder proposition at FMCGCo

Key stakeholders	Value proposition
<i>Shareholder</i>	Operating profit and market share, volume; cash flow; effective tax rate
<i>Customers (Tier One)</i>	Cost effective supply; minimum inventory; frequent delivery and corporation to develop new products.
<i>Employees</i>	Continuity of employment; develop excellent individuals; good working environments; high rewards
<i>Suppliers</i>	Direct relationship and support; Long-term relationship and commitment; good corporate conduct; mutual benefit
<i>Government/ Legislative /Community/ Pressure groups</i>	Tax; Continuity of employment; Health risks, promote awareness and corporate responsibility, reduction in chemical agents; eliminating child labour

8.2.1. Competitive Context and Market Drivers

Legislation & external influences: Over the years pressure groups have lobbied governments about the health benefits of the products. As a result, the industry has faced increasing legislative restrictions (particularly on advertising) and frequent tax increases on their products. To add to this there has been an increase of 7% in the illegal trade of counterfeits and this is expected to grow.

End user demand: Hikes in excise rates and price increase of manufacturers have resulted in End Users switching from premium brands to cheaper brands or giving up the product for health purposes. It has also furthered contraband activity.

Customer demands: Increasing legislative constraints in the industry have meant that Tier One are becoming more reliant on the manufacturing side of the business (FMCGCo) as they have started to market through consumer touch points of product and packaging (**Figure 8-2**) as a means to differentiate as volumes are falling.

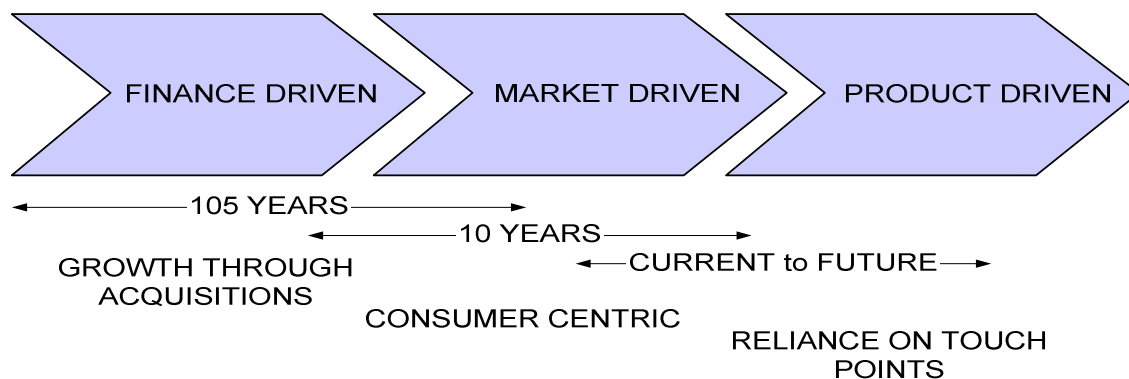


Figure 8-2: Evolution of FMCGCo

Development in technology: Development in technology is slow as manufacturers want to maximise utilisation of their high capital investments.

Costs and profits: Therefore in such a mature industry that is experiencing falling volumes, fierce competition, a demanding regulatory environment, tax increases and illicit trade, there is a lot of discount competition. This increases pressure to maximise efficiency as well as efficiently introduce variants as a means to increase margins and discourage

counterfeits. This was deemed to be the competitive strength of FMCGCo above its competitors and proved by its market share gain in market A (**Figure 8-3**).

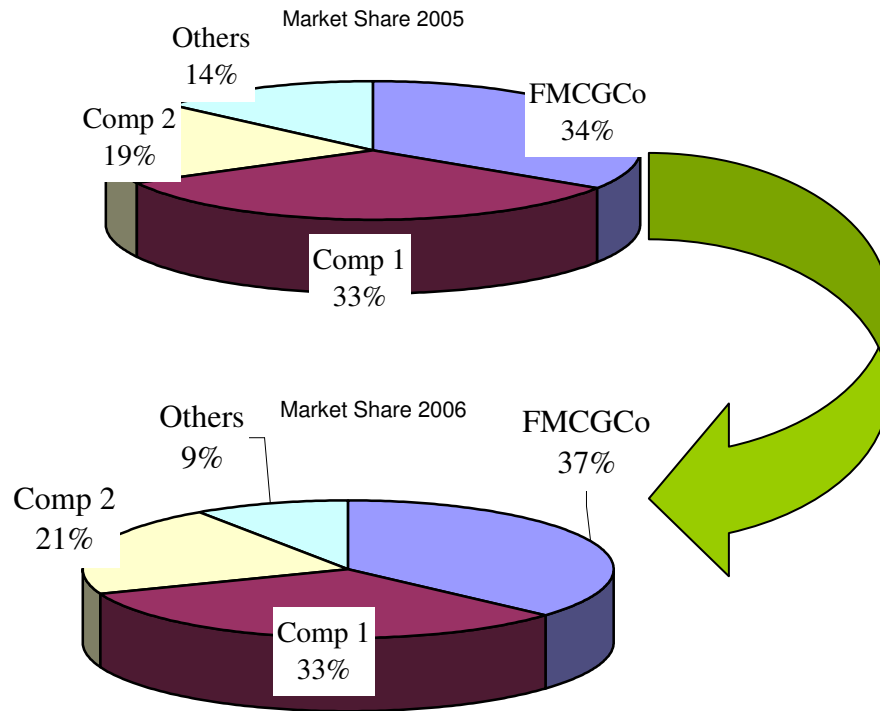


Figure 8-3: FMCGCo's competitiveness in Market A

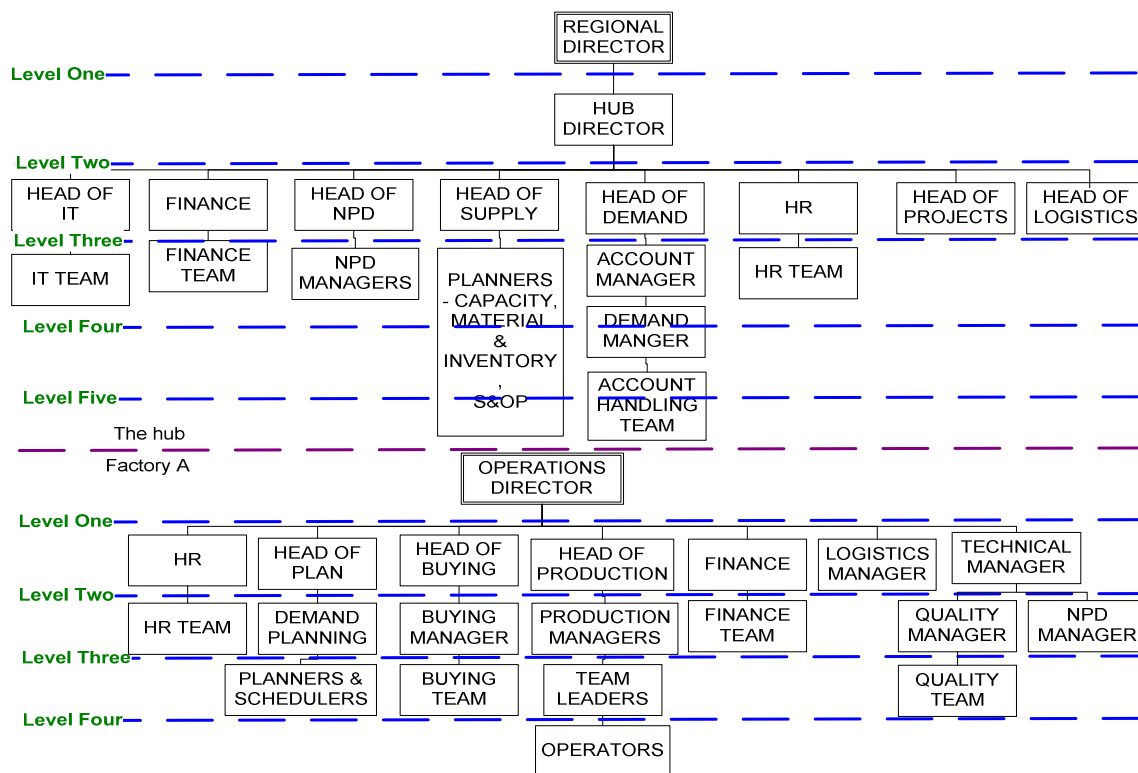


Figure 8-4: summarised organisation chart of FMCGCo

8.2.2. Strategy Flow

FMCGCo as a business unit has been set financial objectives of improving operating profits and helping Tier One customers to increase market share in their respective regions.

FMCGCo's strategy for doing this is by reorganising its supply chain structure. **Figure 8-5** depicts the change from the old structure to the new structure and **Table 6-6** summarises the characteristics of this strategy.

Table 8-5: Strategy flow at FMCGCo

Strategy Levels	Characteristics
Business Unit Strategy	Moving from having dedicated factories for each market to multiple factories serving multiple markets via a centralised supply chain. Decision variables: Cost reduction, speeding up delivery of innovations, customer focus. <i>Segmentation variable: Factory capacity, Machine capacity and Legislative constraints</i>
Demand strategy	Move from local to regional S&OP, demand planning and account management. Decision variables: volume, variety, capacity constraints. <i>Segmentation variable: Local markets - account management differentiated by markets to address specific market needs.</i>
Supply strategy	Group sourcing, procurement and logistics; Move from local to regional planning, S&OP Decision variables: cost versus flexibility. <i>Segmentation variable: 'one size fits all' local markets</i>
Manufacturing Strategy (factory)	Objective of operational excellence. Schedule and execute orders according to demand from supply chain hub. Decision variables: cost delivery reliability, product quality versus flexibility, speed and innovation. <i>Segmentation variable: Base versus surge demand; Lean versus Agile</i>
Product strategy	Global brand strategy; move from local to regional product development. Decision variables: formats, blend, packaging, speed <i>Segmentation variable: Brand strategy; new variant</i>

The strategy was cascaded primarily through emailed presentations to various levels of management who were advised to communicate with their respective teams. There were also face-to-face presentations to impacted teams; this included senior managers at Tier One: Market A. Hardcopy CDs of the new operations strategy were made and distributed.

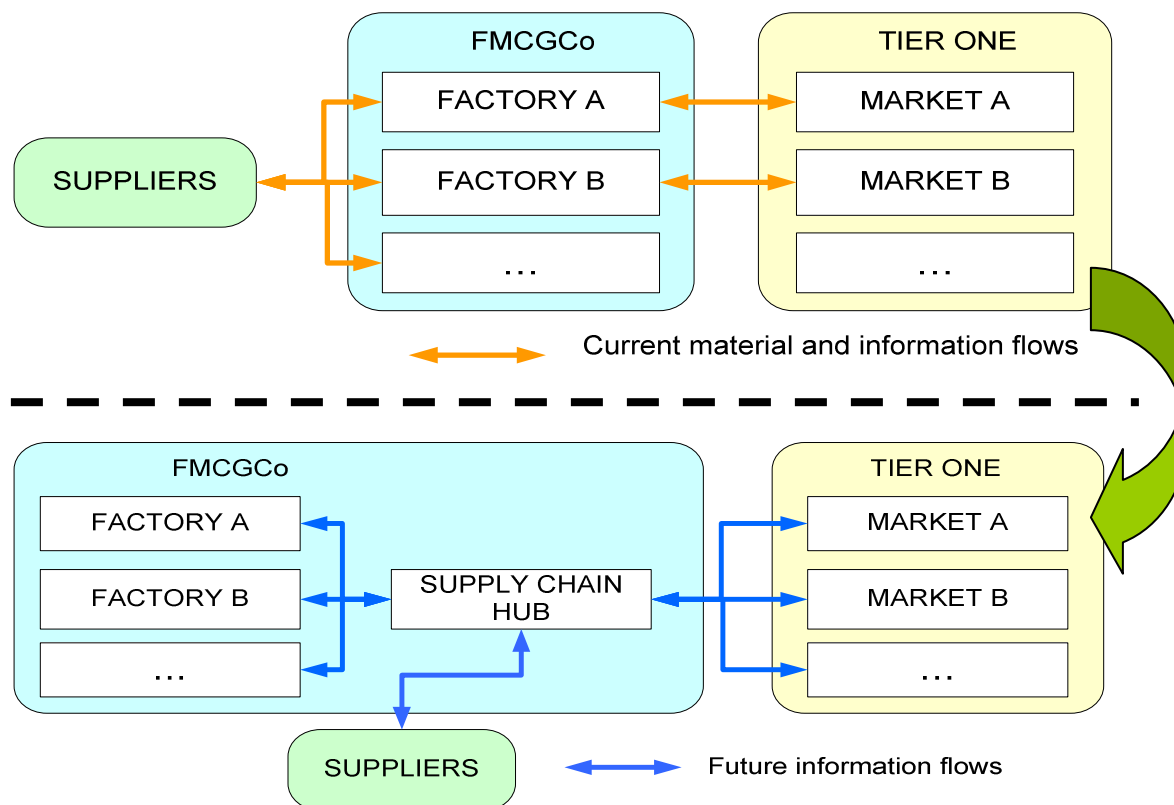


Figure 8-5: New supply chain structure for FMCGCo

As depicted in **Figure 8-3**, the organisation was already performing well in Market A where it is gaining significant market shares. This was because there was customer intimacy between Market A and Factory A. They were integrated and even shared support functions. The responsiveness model was used to highlight impacts of implementing this new strategy on the ability of FMCGCo to respond to markets. **Table 8-6** describes some of the value gaps that were identified during the process.

Table 8-6: Value gaps at FMCGCo

Value gaps	Description
Hierarchical	<ul style="list-style-type: none"> ▪ All three organisations are very hierarchical and a lot of the strategy was lost in translation. There was strong alignment at senior levels.
Functional	<ul style="list-style-type: none"> ▪ On a process level there was a lack of clarity about how the new strategy would work in detail and which function would communicate with which.
Layout	<ul style="list-style-type: none"> ▪ The geographical locations of the hub, Factory A and Market A made it difficult to overcome issues.
Financial	<ul style="list-style-type: none"> ▪ Factory A is a profit centre and it had concerns about the hub being in control of how much profit it can make as it depended on the volume of orders it would be allocated by the hub.
Process disconnects	<ul style="list-style-type: none"> ▪ Role clarification between Factory A and the hub were required. ▪ Factory A stands to lose visibility of demand and the hub has no complete visibility of factory machines in its IT system.
Organisational	<ul style="list-style-type: none"> ▪ Market A considered it a loss in intimacy with Factory A as it would mean less flexibility, less autonomy and a longer decision making process in a volatile market. ▪ Danger in limited creativity and loss of factory input into innovation (a key competitive advantage). ▪ Market A fears a loss of becoming less of a priority and continuity of supply (or stock outs) during the transition of Factory A. ▪ Factory A loss in flexibility with suppliers and production planning. ▪ Suppliers had not been notified yet of the switch from dealing with Factory A to the hub. ▪ Some concerns about language barriers between local suppliers and the hub.

8.3. BPMS Framework

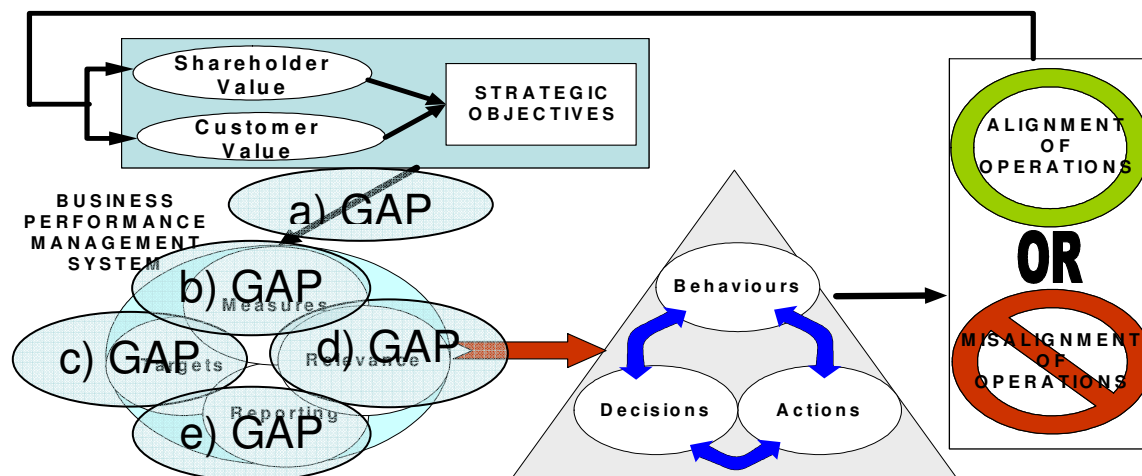


Figure 8-6: BPMS alignment at FMCGCo

Using the BPMS framework to view FMCGCo's process highlighted that FMCGCo had a well defined strategy with clear objectives.

Business Performance Management System – Factory A							
	Initial		Future		Implementation		
Targets	Shared targets with Market A		More operations focused targets		Incentives	Perceptions	
Metrics	Functional metrics		Some metrics become of a higher priority & supply chain based				Mechanisms
Reporting	Reviews functional, informal, different reporting formats,		Formalised due to geographical locations & systems based				
Relevance	Unit of analysis is factory based.		Involvement of key stakeholders & timely				

Figure 8-7: BPMS at FMCGCo

- a) Overall the strategy was well communicated as all the employees interviewed were familiar with it. However this had not yet been transformed into the BPMS. **Figure 8-7** summarises the change in BPMS as a result of the new strategy.
- b) A key success criterion (**Table 8-7**) of the implementation for senior management and Market A is that Market A will continue to be served at the same customer service. This indicates that some existing measures may no longer be relevant to Factory A, some become shared and some take higher priority than others.
- c) Some targets will need to be shared with the hub especially as they will have an influence on the capability of Factory A to deliver (order lead time). Factory A will also need to lose its shared targets Market A as it potentially be serving other markets.
- d) The relevance of the BPMS varies from factory specific to supply chain level. Existing plans were to make factories compete against each other.
- e) The geographical distance between the hub means that reporting will need to be formalised and clarify responsibilities for actions.

Table 8-7: Success criterion “Maintaining and improving level of service to market”

Success Measures	Key influence
No out-stock	Order lead-time increase, visibility, poor planning
Reduced cost	Factory complexity increase
No customer order delays	Capacity constraints
OTIF	Poor planning
VMI conformance	Above factory coordination, demand from other markets
Factory conformance to plan	Availability of RM, Tax stamp lead-time
No blame but solutions approach	Reporting, action plan
Speed in responding and rectifying issues	Regularity of reporting, relationship
Accurate escalation	Mapped escalation paths
RM availability	Supplier involvement, S&OP
Forecast change flexibility	Volatility of market

The behavioural impact of BPMS indicated by **Figure 8-6**, **Table 8-10** and **Table 8-11** means that if incentives are not aligned to FMCGCo it could lead to misaligned behaviours, decisions and actions that will lead to misaligned operations.

A short survey was conducted across senior management at Factory A and Market A and key interface staff to test this. The aim of the survey was to examine customer values at two distinctive stages of the product life cycle of product launch and steady state. **Figure 8-8** and **Figure 8-9** are the aggregated results of the 12 respondents (Six from Factory A and Six from Market A).

The needs of Market A during product launch are signified by the shaded graph whilst Factory A's perception of Market A's need is denoted by the smooth burgundy line. These show that Factory A understands Market A's needs during product launch. The performance ratings show that Market A is relatively happy with Factory A with very few performance gaps.

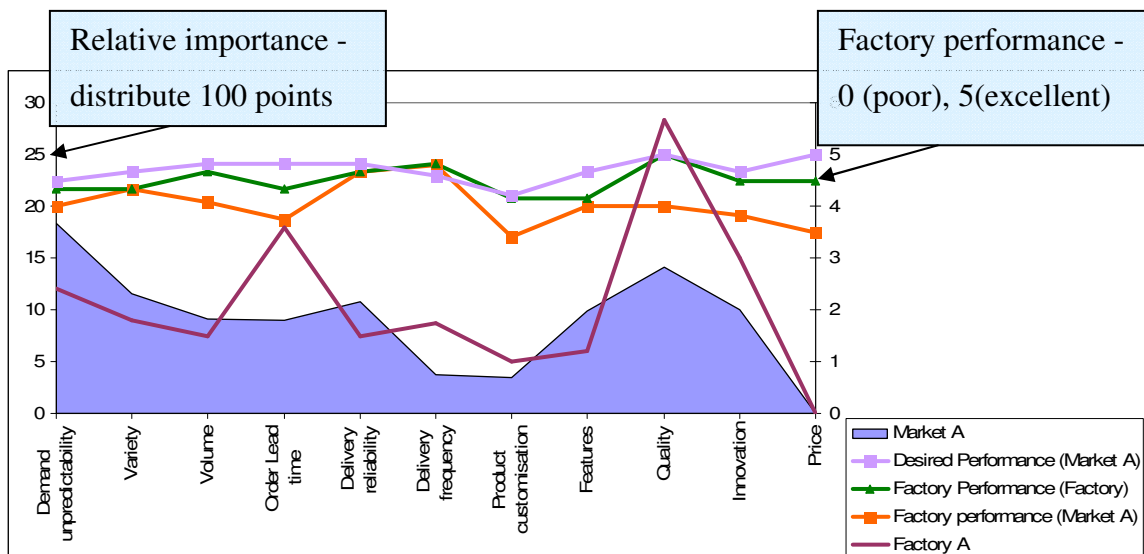


Figure 8-8: Responsiveness of Factory A with Market A at product launch

Table 8-8: Response implication for product launch

Key values	Measures and decision criteria	Implication
Flexibility	Shorter RM lead time v. high stocks in RM	Agile Response
Speed	Shorter factory lead time v. high stocks in FG	
Innovation	NPD lead time	

The relative importance rating together with the performance gaps indicated by Market A also highlight the customer's key response expectations of Factory A at product launch. The top three and their implication is summarised on **Table 8-8**. Further validation showed that Factory A considers speed as a means to improve flexibility hence rating it higher.

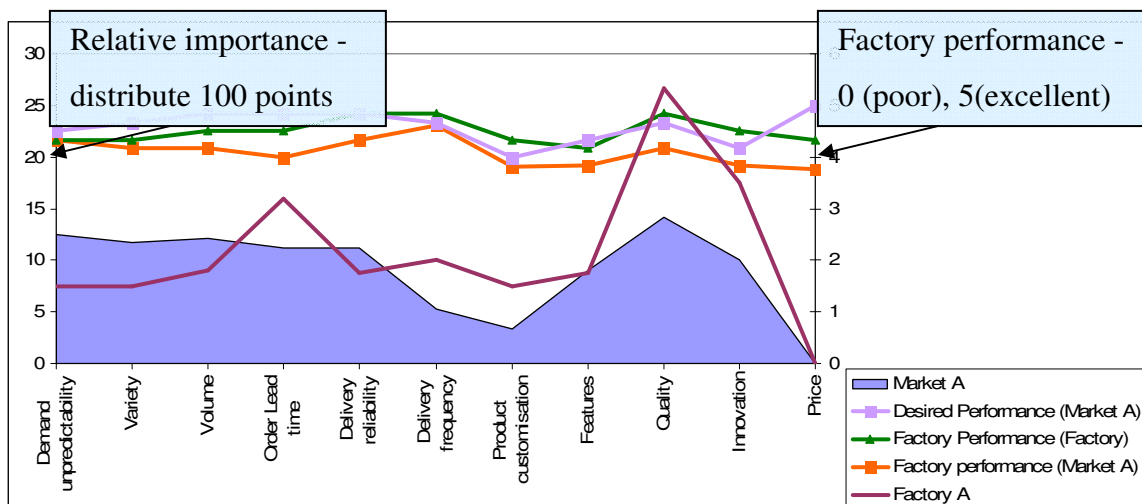


Figure 8-9: Responsiveness of Factory A to Market A at steady state

The same codes have been used for steady state as well as product launch. Applying the same principle used for product launch at steady state results in **Table 8-9**.

Table 8-9: Response implication for steady state

Key values	Measures and decision criteria	Implication
Cost	productivity, efficiency, utilisation, waste	Lean
Delivery reliability	frequency, OTIF, VMI conformance	Response
Product quality	Consistent improvement	

Looking across both charts implies two types response that are required for the volatile nature of the market A. Some of the drivers of agile response are monthly promotions that require different labelling and new variant introductions. Therefore the lean response measures can be considered to be base performance for the factory whilst agile response is required to enable alignment with marketing activities. These performance requirements further imply the starting point for the hub for it to meet its key success criterion. However

the metrics do not only lie with the factory. The following have been identified as the shared metrics between Factory A and the hub as a result of **Figure 8-12**:

- Total supply chain cost
- Speed of new product introduction
- Order lead-time
- Supply chain profitability
- Hub flexibility

The similarity in perceptions of relative importance indicates the strong intimacy and alignment that exists between Factory A and Market A. This makes intimacy a strong enabler for Market A to see the strategy a success. The relationship maps on **Figure 8-10** and **Figure 8-11** examine this.

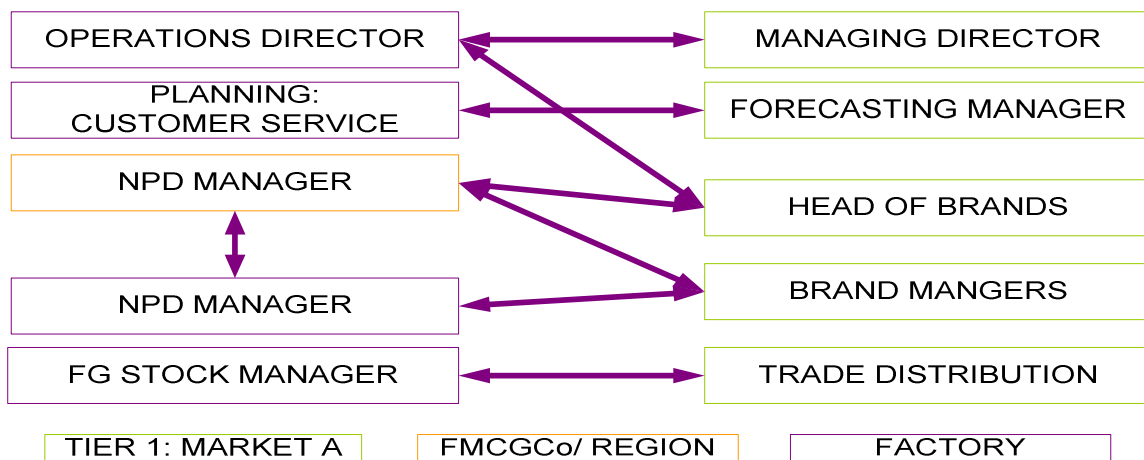


Figure 8-10: Existing relationship between Factory A and Market A

A strong intimacy exists between Market A and Factory A because they have been operating as an integrated business for 10 years and share strategic objectives. Over 90% of Factory A's volume goes to Market A. They are closely located and so they operate as a dedicated production facility to Market A offering it first priority. The new strategy of FMCGCo will separate this (**Figure 8-11**).

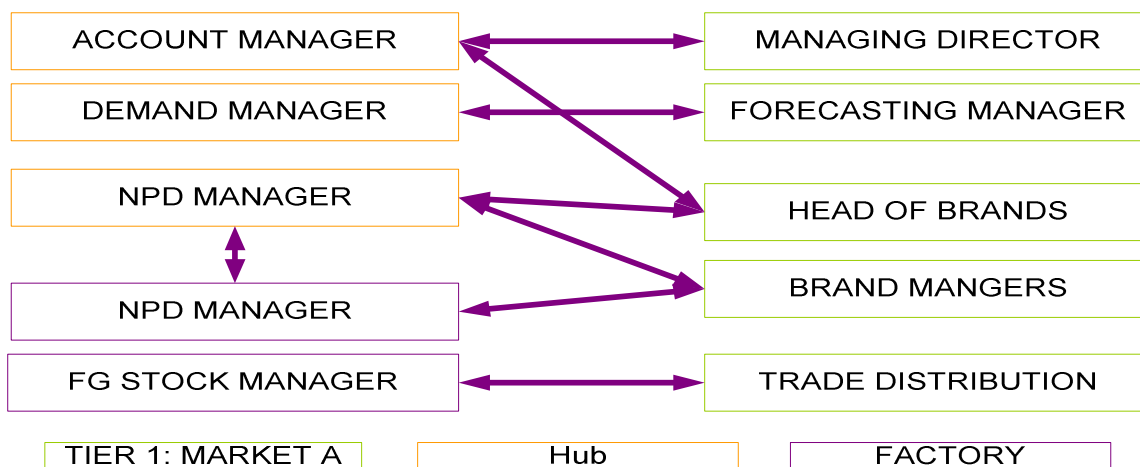


Figure 8-11: Relationship transformation

There is a potential loss in priority as the account management and demand management role replacing existing roles of the Operations Director and Customer Service are not purely focussed on Market A. Also the demand management role will be located at the hub. This means that success in intimacy is highly dependent on an individual – on how good the account manager is. Further the work load on that particular individual may limit intimacy and Factory A will have different goals as it is serving other markets. Other enablers can be found on **Table 8-11**.

Table 8-10: Implementation factors at FMCGCo

Factors	Incentives	Perceptions	Mechanisms	Example
Internal competition	N/A	☹	☹	Factories competing for business. Profit control through allocation from the hub.
Misaligned target setting	☹	N/A	☹	Factories may become more interested in volume products to maximise efficiency and profits and may resist low volume or new product. Like for like comparison with other factories whether lean or agile.
Fragmentation of ownership	☹	☹	☹	Profit centre – bonus scheme. Ownership of problem at different levels. Roles and responsibility clarification.
Understanding & identifying appropriate customer segments	N/A	☹	☹	Need to do a quantitative assessment of demand variability in markets to establish facts and determine response. Market segmentation at the hub determines what is allocated to what factory implying target setting for that factory / lines.
Organisation structure and design	N/A	N/A	☹	Evolving structure
Demand Uncertainty	N/A	N/A	☹	Less visibility in factory

☺ - enabling ☹ - inhibiting N/A – not applicable ☹ - needs managing

Table 8-11: Enablers and Inhibitors to responsiveness at FMCGCo

Factors	Phase One	Summary of evidence
Demand uncertainty & variability	☹ Ability to recognise / anticipate demand; ☹ Joint level of planning; ☹ Management of product variety; ☹ Cooperation to develop new products	Market A is already operating at maximum capacity with Factory A and there were concerns about competing for capacity.
Supply chain flexibility	☹ Buffers; ☹ Inventory levels	Working at very small finished goods stock of 12 days across Factory A and Market A warehouse.
Integration of information systems, functions and organisations	☺ Integration of functions ☺ Integration of information systems ☹ Integration of organisations	Implementing SAP as part of the transition. Complicated system interfaces and some may not be real time.
Timely flow of goods and information	☹ Lead time compression; ☹ Demand transparency; ☹ Timely information; ☺ Relevant and accurate information; ☹ Open communication; ☹ Commitment to sharing information;	From the perspective of Market A, a longer decision making process. Order lead time is longer and demand transparency is reduced at the factory. The communication and information sharing processes are currently informal between factory and Market A.

☺ - enabling ☹ - inhibiting N/A – not applicable ☹ - needs managing

Factors	Phase One	Summary of evidence
Organisation structure – intra and inter organisational team	☺ Process orientation and work flow structure plus inter-firm; Functional orientation; ☺ Cross functional teams	The organisation structure at the hub is process oriented with process managers and the functional orientation of Factory A is being transformed into a process structure. Flattening the existing hierarchical structure and simplifying the process.
Management methods	☺ Manufacturing flow – aligned to customer demands; ☺ Production control methods aligned with business drivers; ☺ Synchronisation of management and workforce; ☺ Level of complementary philosophies; ☺ Supportive / participative management; ☺ Leadership; ☺ Coercive power; ☺ Trust	Factory focus is going to become primarily focused on efficiency. Tier One needs are going to be managed strategically from the hub rationalising flexibility to Tier One by offering alternatives where possible when it comes to new variants. All entities have a culture of continuous improvement. Management style is generally supportive and participative but a lack of visibility of management from the hub at the factory left a feeling of uncertainty and mistrust.
Culture and attitudes	☺ Internal competition; ☺ Continuous improvement; ☺ Joint terminology; ☺ Cooperative	FMCGCo and Market A has a strong culture of continuous improvement. Some language barriers due to geographical location may need to be managed.
<i>Performance measurement</i>	☺ Decision making capability; ☺ Joint problem solving; ☺ Joint level of using performance measures; ☺ Joint target setting	FMCGCo has left the implementation of a performance system to post-implementation of the new strategy.

☺ - enabling ☹ - inhibiting N/A – not applicable ☺ - needs managing

Factors	Phase One	Summary of evidence
<i>Shared goals, resources and benefits</i>	⊕ Incentives to remain aligned; ⊕ individual goals; ⊖ Conflicting goals; ⊕ Shared risks; ⊕ Shared rewards	Market A is influenced by market share whilst FMCGCo is influenced by cost reduction. Rewards set for management are based on this and so need to be amended in order for the strategy to be successful. Also it has to be set in a manner that does not affect the Group its innovative competitive edge.
<i>Difficulty in executing new strategies</i>	⊕ Strategy formulation; ⊕ Decision-making capability; ⊖ Stakeholder involvement; ⊖ Strategy deployment process	FMCGCo encourages an enterprising culture. Such ‘can-do’ approach and its openness to advice (use of external resources) make it possible for it to implement its ambitious plans. Most employees supportive of the change. Major concerns were mainly about their role in implementing the change.
Understanding and identifying appropriate customer segments	⊕ Variable identifiable and measurable; ⊕ Relevant to purchase of product and buyer behaviour; ⊕ Sufficient size for adequate return; ⊖ Accessible through available marketing channels	There are a number of factors that can inhibit the new strategy from responding appropriately to its markets. These have been summarised on Figure 8-12 . FMCGCo is going ahead of this change without fully understanding how it is going to segment the markets or allocate volumes to the factories. All are geographically dispersed and this may mean there could be legislative constraints or brand value constraints to serving a particular market from certain factories.

⊕ - enabling ⊖ - inhibiting N/A – not applicable ⊕ - needs managing

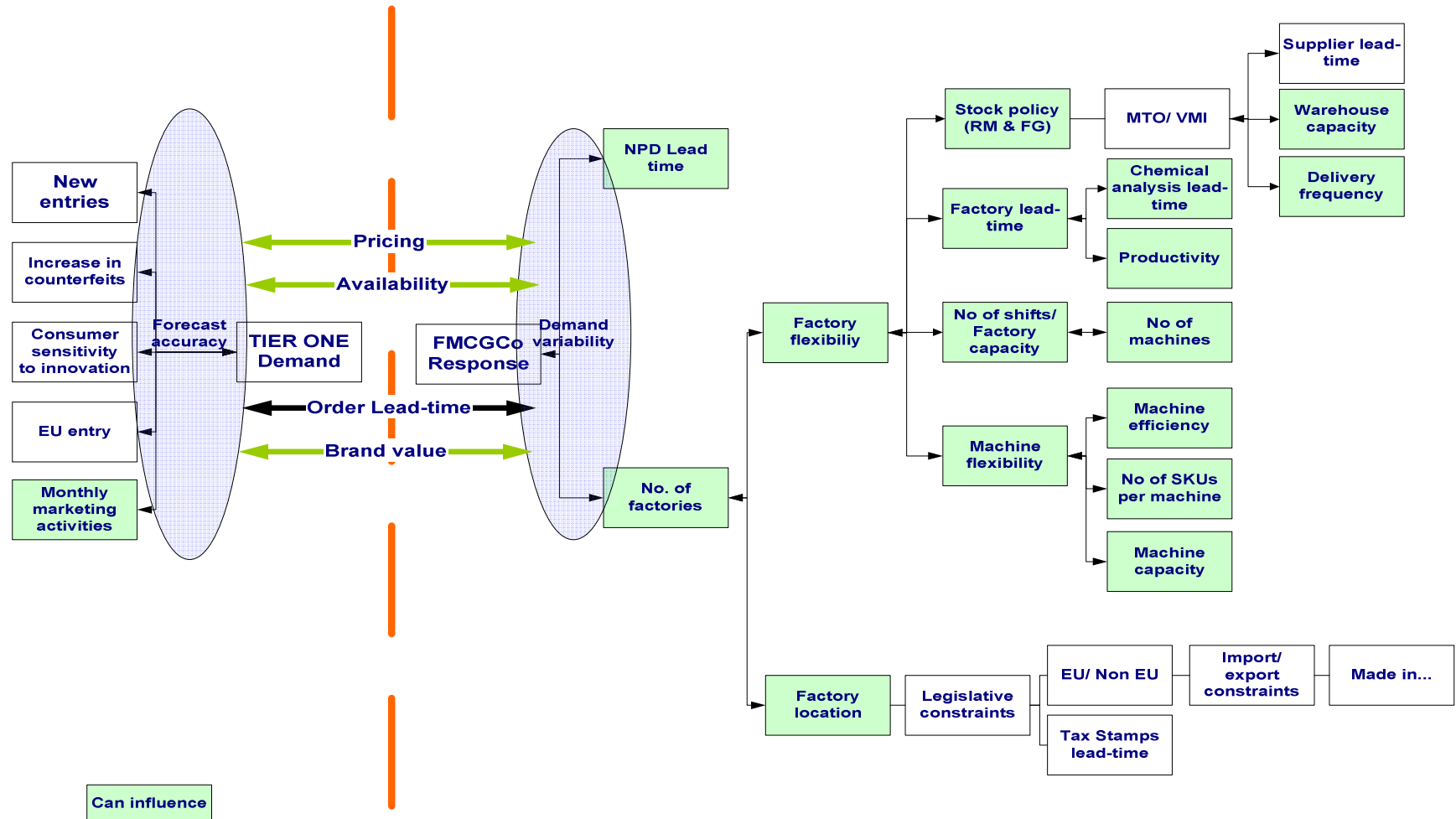


Figure 8-12: Operational levers to align supply with demand

8.4. Competitive and Strategic Response (Retrospective Look)

Overall FMCGCo provided a good case example of implementing strategy. Frequent introduction of new variants were adding complexities to FMCGCo and some were deemed to be non-consumer relevant. Moving to the new strategy was intended to help alleviate such complexities. Despite coming up with detailed plans and implementing a new IT system, a number of value gaps and alignment gaps were highlighted that could affect the success of the implementation. FMCGCo had left the implementation of a BPMS till post-implementation. The impacts of BPMS in inducing behavioural change mean that old behaviours would still be in place. Also FMCGCo had not done the analysis on how it would be segmenting its markets. Segmenting them on the basis of account management risks a loss in intimacy and particularly as the function relies on an individual. This implies a strong interface management team with regular communications such that account management has supporting roles to handle the work load. Mapping out operational levers on **Figure 8-12** shows that to overcome this FMCGCo will need to segment markets initially by their level of predictability and then by SKU due to machine constraints. Further the performance indications from **Section 8.3** mark two types of response. The existing reward system may cause factories in the new strategy to resist low volumes and high unpredictability. To overcome this, the hub would need to set performance agreements with the factories and recognise differences in performance at the two stages of product launch and steady state. It may be that markets requiring more agile response are best served by the closest geographical location for speed, innovation (input from operations) and flexibility. In cases where new products/ variants exist in other markets, the factory producing that SKU may be a quicker way of getting the product to the customer in time. This means that flexibility is not judged purely on a factory basis but on the hub as a whole meaning that the loss in intimacy may not be real as it depends on access to more factories and wider capabilities. However FMCGCo's flexibility may be limited by some legislative constraints, e.g. different government tax stamp process, and these need to be investigated.

Some additional tensions include the influence of Market A by market share while FMCGCo is influenced by cost reduction, the legislative constraints that have led Market A to be increasingly become reliant on its supply chain for innovation could lead to more behavioural challenges. Lack of clarity in roles and responsibilities risks Market A reverting to old ways of working and looking for old contacts and further risking failure in executing the new strategy. The concurrent implementation of a new IT system forces a change in the way Market A submit orders & forecasts. With too many changes occurring at the same time, there was uncertainty about the future state and how aligned the changes (both controllable & uncontrollable) were. This made it vital for them to have escalation paths as for managing scenarios. To overcome this FMCGCo would need to keep existing interface managers and slowly build up customer facing teams.

8.4.1. Theory Building from FMCGCo

Lessons learnt from the case of FMCGCo help to strengthen theory building from previous cases as well as build some new theory.

- Behavioural alignment has been more emphasised in this case than previous cases. Perhaps due to its implementation nature. Particularly the case confirms that successful alignment is not just strategic or process based but also behavioural. Behavioural alignment requires the matching of mechanisms (systems, processes and structure), people and incentives for it to occur.
- The need to investigate the flexibility of FMCGCo as a whole has helped to develop a decision making tool (**Figure 8-12**) that can be made generic to enable organisations to understand operational levers to align supply and demand in their supply networks.
- The nature of the organisation supports previous theory on formalised information sharing in dispersed networks.
- It also supports the need to differentiate performance for varying types of response.
- Strong working relationship between Factory A and Market A, their flexible approach in dealing with each other and positive attitude to change suggests and confirms some enablers to responsiveness. These also include strong communication skills, clarity of

roles and responsibilities. These enablers need to be used to enhance the existing model.

- Applying the framework during such a transition phase at FMCGCo shows the dynamic nature of the framework in terms of its applicability at different stages of a strategy process (from formulation to implementation). It is dynamic in the sense that it not only recognises different stages in a product life cycle but it shows that it can be applicable at different units of analysis.

8.5. Conclusions: Discussion and Summary Of Findings

The implementation of a new strategy at FMCGCo was a testing proposition for the organisation especially as it has not traditionally relied on organic growth in the past. The organisation is one that also places strong emphasis on other stakeholder values other than customer value and shareholder value, perhaps due to its controversial industry.

Nevertheless FMCGCo was a particularly interesting case to apply the market responsiveness model to as, compared to the other cases, it was at a different stage of the strategy process - implementation. Its approach to this has proved to be a model example. It has also furthered the use of the responsiveness model as dynamic tool and has enabled the identification of operational levers to align supply with demand. This potentially can help close the gap between operations and marketing by providing a practical tool for managers to use in supply chain decision making. The case has helped to confirm some of the findings from previous cases and has further highlighted a need to further develop some aspects of the model into practical useful tools for management use.

The next chapter compares the findings from each case to mark their similarities and differences in order to finalise the constitution of a generic market responsiveness model.

CHAPTER 9.**Research Findings and Cross-case Analysis**

The purpose of *Chapter 9: Research Findings and Cross case analysis* is to:

- Compare and contrast similarities and differences between the cases.
- Identify the context specific and generic aspects of the cases in this research.
- Summarise findings across all the cases and modify the responsiveness model accordingly.

9.1. Background data summary**Table 9-1: Background data**

Background Data	PilotCo (2004)	ElecCo (2005)	AutoCo (2006)	FMCGCo (2006)
Age	> 16 years	>25 years	unknown	>100
Part of group	Yes	Yes	Yes	Yes
% Contribution to group sales revenue	<15%	< 5%	<20%	>30%
Sales turnover (range)	10 millions	100 millions	10 millions	1000 millions
Net Profit (%)	25%	<5%	<15%	<5%
Investment in R&D	7%	17%	7% group wide	1% group wide
No. Employees (Direct & Long-term contract)	<250	<250	<250	>1000
Geographical breadth	Europe	Global	Global	Global
Output / year (units)	> 1 million	<100	<1 million	> 200 billion
No of parts / unit	30	54,000	54	30
No. Customers	1	<50	>50	Tier 1 >10, Tier 2 >10000
No. Suppliers	<50	<200,<75 direct	<80	<50

The data presented in the tables in this chapter compares the cases following the responsiveness model. At focal organisations, research interest was primarily on the internal supply chain functions of manufacturing, product development and marketing.

9.2. Firm Orientation and Value gaps

A consistent finding across all the cases is that shareholder value creation was deemed to be the primary objective of the organisation. Other stakeholder needs were important as far as they impeded shareholder value. Although they were all floated on a stock exchange they were all primarily interested in long-term growth and survival and this is contrary to the short-term orientation typically associated with shareholder value. In the case of ElecCo had experienced downturns in its industry cycle. The frequent downsizing had had a negative impact on the organisation especially as the organisation requires specialised skills. The newly appointed director was also seeking long-term shareholder value creation but at the same time under pressure from its corporate group to deliver results. So whilst long-term shareholder value may not be in conflict with meeting other stakeholder needs, personal ambitions of a business head and corporate head can be inhibiting and leads to reactive management that could ultimately damage any value created. This further confirms the value gaps theory (**Figure 9-1**) that top-down intra-organisational alignment (green line) is mainly concerned with shareholder value and that the higher up the corporate ladder the more that concern increases. The findings support propositions one, two and three in CHAPTER 4.

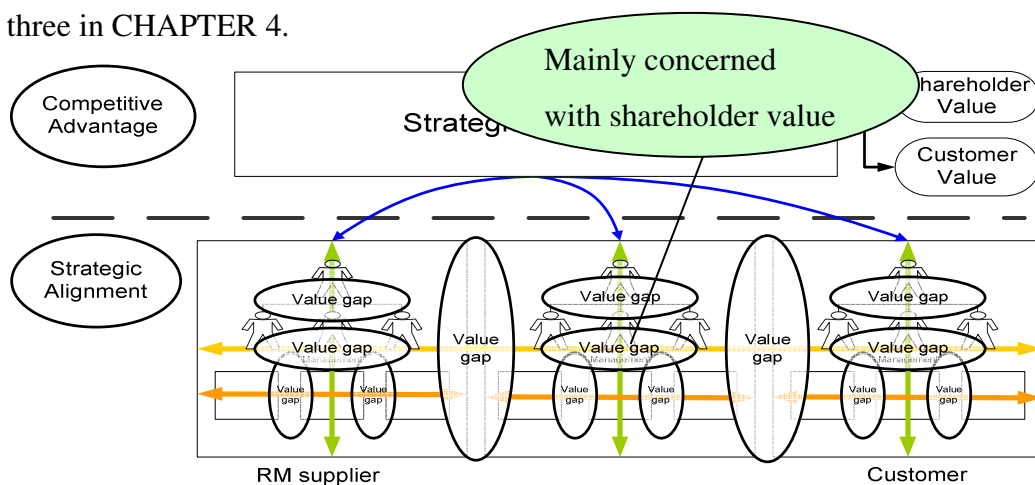


Figure 9-1: Value gaps validation

Shareholder value drivers as identified by Rappaport (1993) include: sales growth rate, operating profit margin, income tax rate, working capital investment, fixed capital investment, cost of capital and value growth. **Table 9-2** indicates how these are inextricably linked with customer value meaning that from an operations perspective, shareholder value cannot be created without some form of customer value creation. Further, it was found that there exists a point within a business where optimal shareholder value and customer value can be created and this is at the value execution point (**Table 9-4**).

Table 9-2: Shareholder value drivers and customer value implications

Shareholder value drivers	Operational implications	Customer value implications
Sales growth	Product variety/ new markets , promotion/ marketing activities, cost, brand value	Price, options, brand perception
Operating profit margin	Cost , differentiated processes, differentiated product and service	Brand perception. Price, reliability, satisfaction
Income tax rate	Location of facilities, labour, cost of supply, outsourcing, excise management , lead time / delivery speed	Brand perception, price, waiting time/ delivery speed
Working capital investment	Inventory levels → production volumes / delivery speed	Timely delivery of goods, availability
Fixed capital investment	Capacity utilisation → production volumes → inventory levels → over/ under supply → product commoditisation / scarcity	Brand perception, availability
Cost of capital	Risks in operations → over/under supply → business continuity	Availability
Value growth duration	Reactive / Proactive management → operational risks (e.g. downsizing / supplier rationalisation)→ business continuity	Inconsistent service/ value proposition, brand perception,

Table 9-3: Competitive dimensions and market drivers

	PilotCo	ElecCo	AutoCo	FMCGCo
Primary orientation	Shareholder value	Shareholder value	Shareholder value	Shareholder value
Other key stakeholder groups - legislation & external/ threatening influences	Food Standards agency – food safety	None with major	IMDS – end of life management	Pressure groups – health related concerns
Barriers to entry	Medium – big players have taken the market	High – small market specialised skill & high capital investment	Low -many suppliers, lower cost countries	High – due to high capital investment
Bargaining power of buyers	High	Medium to high	High	Medium to high
Bargaining power of suppliers	Low to medium	High to medium	Typically low	Low
Threat of substitute products	Yes - increasingly	Possibly with new technology	Yes – many alternatives	No
Competitors	2 direct	3 direct	1 direct, 2 indirect	6 direct
Rate & pace of technology	Low	High	High	Medium
Overall rate of market movement (industry v market)	Medium growth versus fast growth	Stabilising growth versus stabilising growth	Slow decline versus fast growth	Slow decline versus fast growth
Intensity of rivalry	Low to Medium	High	Medium to High	High

Table 9-4: Strategic dimensions and firm orientation

	PilotCo	ElecCo	AutoCo	FMCGCo
Vision/ Strategic intent	Close to customer & partnership in development and focus on specific product categories	No 1 in product development; continue to serve key customer well; customer intimacy & operations excellence	Unique products in specialised market segments, operations excellence & product leadership	Growth, operations excellence, responsibility, outstanding people/ & help customers to win,
Strategic architecture (Perceived core competence)	Cross fertilisation of knowledge across group (NPD)	Strong engineering base; financial backing (Engineering)	Strong VM relationships; product design capabilities;	Use of excess capacities; people; new operating model; financial backing
Corporate strategy?	Yes	Yes	Yes	Yes
Business unit strategy?	Yes	No	Yes	Yes
Market strategy?	Yes	No	Yes	Yes
Supply chain strategy?	No	No	No	Yes
Manufacturing strategy?	No	Yes	Yes	Yes
Product strategy?	No	Yes	No	Yes
Group segmentation of business units	Product categories then by customer volumes	Market then by product categories	Product categories then by region or account	By region
Value execution point	Production	Engineering	Bidding stage & NPD	The hub

9.2.1. Value Execution Point

The value execution point (VEP) is a point in the organisation where customer orders can be transformed within the organisation to create maximum shareholder value and customer value to the organisation. This concept has been found to work consistently across the cases. For PilotCo, the VEP is in operations as operations are tasked with converting recipes that have been made in a kitchen by the new products team into a mass product of the same taste / quality with the most efficient processes and number of staff. The success of such a translation within PilotCo determines how much shareholder value is generated for that product line. At ElecCo, the VEP lies in engineering as it is the point where customer orders are transformed into the product design that will meet the requirements of the customer. Optimal shareholder value is also created at this point as the product can be designed: with cost effective materials, on a platform that can maximise operational efficiency by limiting variability & complexities in its supply chain, right first time to reduce the number of engineering change orders that occur and reduced warranty costs/support. At FMCGCo, the VEP is at the hub. The centralisation of its planning and NPD decisions mean that how it decides to allocate orders to its regionally dispersed factories to serve regionally dispersed markets will determine how much shareholder value and customer value is created. Finally at AutoCo, the VEP was found to be at the bidding stage because at this stage the quotation made to the customer with regards to the contract for the manufacture of components for a new platform determines how much shareholder value can be created. The price quoted is based on experience and has to be adhered to along with the year on year discounts. However at AutoCo, customer value can change post-bidding as more flexibility could be required depending on the performance of the product. So reviewing VEPs across the cases show that VEPs may not be static for all organisations, for a product in steady state, operational efficiencies or change in customer service for the product determine where the new VEP lies. The importance of a VEP is that it provides the organisation with a focus on areas to make improvements as leaving them untouched may be too costly whilst improvements in other areas of the business have less of a significant impact on value creation. This was evident with ElecCo that focused its cost reductions on

operations that is 7% of its total costs rather than engineering that is 38% of its costs for fear that it would disrupt its key internal capability.

9.3. Strategy Flow, Value Gaps and Unit Of Analysis

Another consistent finding across all cases was that in the deployment of strategy the message is lost in translation as it travels down the hierarchy. This was largely due to a fragmented approach of functional heads deploying strategy independently to their teams and the inconsistency in the way these functional heads deployed the strategy. Also the strategy deployment processes studied across all the cases were largely unidirectional with little opportunity for feedback on its appropriateness or its feasibility as staffs beyond management are hardly involved. As found in the case of ElecCo and PilotCo, in response to a lack of strategy or an unawareness of strategy, staffs revert to what they suppose to be best practice (**Table 2-2**) in their area of expertise and these result in conflicting targets and sub-optimisation. FMCGCo and AutoCo were stronger on deployment as they had processes in place and the interviews showed this consistency. Yet in these cases a few people understood the cross-functional aspects of it. In the case of FMCGCo detailed process impacts were not understood which, despite a good strategy deployment, indicated a value gap between strategy and supply chain process. Supply chain processes are key for customer value creation, hence the need to follow the strategy flow (**Figure 4-3**) proposed in this research. In all cases but AutoCo, this gap between strategy and supply chain processes was indicated. In AutoCo the strategy, supply chain processes and its structure were aligned but its lack of differentiation between customers indicated a gap in the strategy flow process. Such gaps were consistent across the other cases too and were the result of a misalignment in the unit of analysis. At AutoCo, the ideal unit of analysis is the product as each product is based on a platform specific to a customer. Also product volumes depend on the volume of sales achieved by the VM. So each product potentially has a buying pattern and this buying pattern is also influenced by the policy used by Tier Ones. Identifying and grouping these patterns to respond accordingly will enable the organisation to maximise both shareholder and customer values especially when they are built it into the strategic objectives thus supporting the fourth proposition in **CHAPTER 4**.

Table 9-5: Social dimensions

	PilotCo	ElecCo	AutoCo	FMCGCo
Administrative component	5%	10%	6%	12%
Span of control	20	10	15.7	8.3
Specialisation	6	8	7	7
Standardisation	Reactive management	Reactive management	Fairly standardised	Standardised
Formalisation	Low to Medium	Low	Medium	High
Centralisation	Decentralised – execution centre to customer	Decentralised functionally but highly centralised below functional	Highly centralised – execution centre	Highly decentralised but moving to highly centralised
Complexity	VD = 6; HD=7	VD = 4; HD= 7	VD = 4; HD = 7	VD = 5 - 10; HD= 8
Organisation change	Resignation of previous plant manager	Change in MD	Newly acquired	New strategy
Description of change	Previous plant manager had been there for 10 plus years and had a lot of influence on the company culture	Previous MD has left - company is seeking new direction but group keeps reorganising this entity as a means to manage it	Original management buy-out, acquired by big foreign group in the industry & became public	Grouping of EU supply chains from autonomous entities to a centralised supply chain.
Time of change	3 months before study	6 months before study	2 year prior to study	During study

Table 9-6: Marketing dimensions

	PilotCo	ElecCo	AutoCo	FMCGCo
Target market	Food Retailers	Electronics manufacturers	Premium automotive	Distributors
Market segmentation?	No – one customer	No	Yes	Yes
Primary segmentation variable	N/A	N/A	Vehicle manufacturer account	Geographical location
Market relationship structure	One factory/ many products/ one customer/ one region	One factory/ many products/ many customers/ many regions	One factory/ many products/ many customers/ many regions	Many factories/ many products/ one customer / many regions
Selling point	Internal capability	Technological capability	Unique product capability	N/A –same group
Product promotion medium	Through long term relationship / for end user through associated brand advertising	Customer visits - customer = end user	Customer& customer's customer visits/ for end user through associated brand advertising	N/A – for end user through advertising
End user demand	Necessity and lifestyle	Necessity	Reflection of lifestyle rather than necessity	Reflection of lifestyle rather than necessity
USP to end user	Associated brand & benefits / convenience	Technological capability	Associated brand e.g. BMW/ Jaguar; & benefits	Brand

Table 9-7: Supply chain dimensions

	PilotCo	ElecCo	AutoCo	FMCGCo
Supply chain function	OEM (product)	Design /Assembler (product)	OEM (component)	OEM (product)
Span of external control	Limited to PilotCo only	From materials assembly to installation & maintenance	Limited to AutoCo and its suppliers	Broad from RM suppliers to distribution
Internal supply chain	Design, some raw material processing, component manufacture, sub-assembly and final assembly	Design, final assembly, installation and post sales maintenance	Design, component manufacture, sub-assembly & final assembly	Raw material processing, sub-assembly, final assembly, distribution
Outsourced functions	Outbound logistics and some staff	Sub-assembly, some staff, inbound and outbound logistics	Outbound Logistics	Inbound and outbound Logistics
Route to market	1	Many	Many	1
Variability point	At customer	At customer	At end user; at VM	At customer
Lead time	< 1 day	2 years & less	2 days	2 weeks

continued	PilotCo	ElecCo	AutoCo	FMCGCo
Demand predictability	Slightly unpredictable	Predictable & unpredictable mostly commissioned by customer so pre-planned	Predictable & unpredictable;	Predictable
Volume fluctuations	High Seasonal fluctuations; daily fluctuations – also weather dependent	Low – booked ahead	Low and high dependent on VM strategy	Low – stable volumes with few demand surges
Demand Mix	High - daily mix change request; volume changes	High – customer specific	Low – contracted SKUs	Low – same SKUs produced daily/ weekly
Stock levels	0.3% volume	12% volume (including WIP)	10% volume	3% volume
Differentiated supply chain?	No	No	Logistics differentiated	Manufacturing & delivery differentiated
Differentiating variable	N/A	N/A	By region (customer destination)	Lean and agile response

Table 9-8: Manufacturing dimensions

	PilotCo	ElecCo	AutoCo	FMCGCo
Order fulfilment pattern	MTO	ATF/ ATO/ ETO	KANBAN	VMI / MTO
Process design	Batch	Job shop	Batch	Continuous flow
Order qualifiers	Quality, product development	Technological capability	Quality, innovative product	N/A - internal
Order winners	Flexibility / cost	Delivery reliability / total cost of ownership	Cost / delivery frequency & reliability	N/A - internal
Complexity	Low (0.000012)	High (1)	Low (0.0003)	Low (0.0000054)
Schedule stability	Low	Low	High	High
Degree of customisation	High – one customer	High – customer specific modifications	High – designed to fit customer platforms	N/A
Differentiated manufacturing?	Yes	No	No	Yes
Differentiating variable	Dedicated manufacturing to one customer	N/A – project based	N/A – all lean	Stable / base (Lean) versus New product / Surge demand/ promotions (Agile)

Table 9-9: Product dimensions

	PilotCo	ElecCo	AutoCo	FMCGCo
Product	Consumer goods	Capital equipment	Component	Consumer goods (highly regulated)
Design	PilotCo & Customer	ElecCo & supplier	AutoCo, sometimes & customer	FMCGCo & customer
Intellectual property	None but customer specific design	ElecCo & some owned by supplier	None but mainly AutoCo product	The group
Shelf life	< 4 days	>5 years	> 15 years	< 3 months
Volume	< 3 million	<100	<1 million	>200 billion
BOM	12	54000	54	30
Variety	36	100	300	6 x 40 x 4500
Differentiated products?	Customer specific	Customer specific	Customer specific	Customer specific
Branded?	Yes	Yes	No -	Yes
Brand ownership	Customer	Group	Associated with customer brand	Group & customer
Lifecycle stage	See Figure 9-2			
Product classification	Repeaters	Strangers	Repeaters	Runners

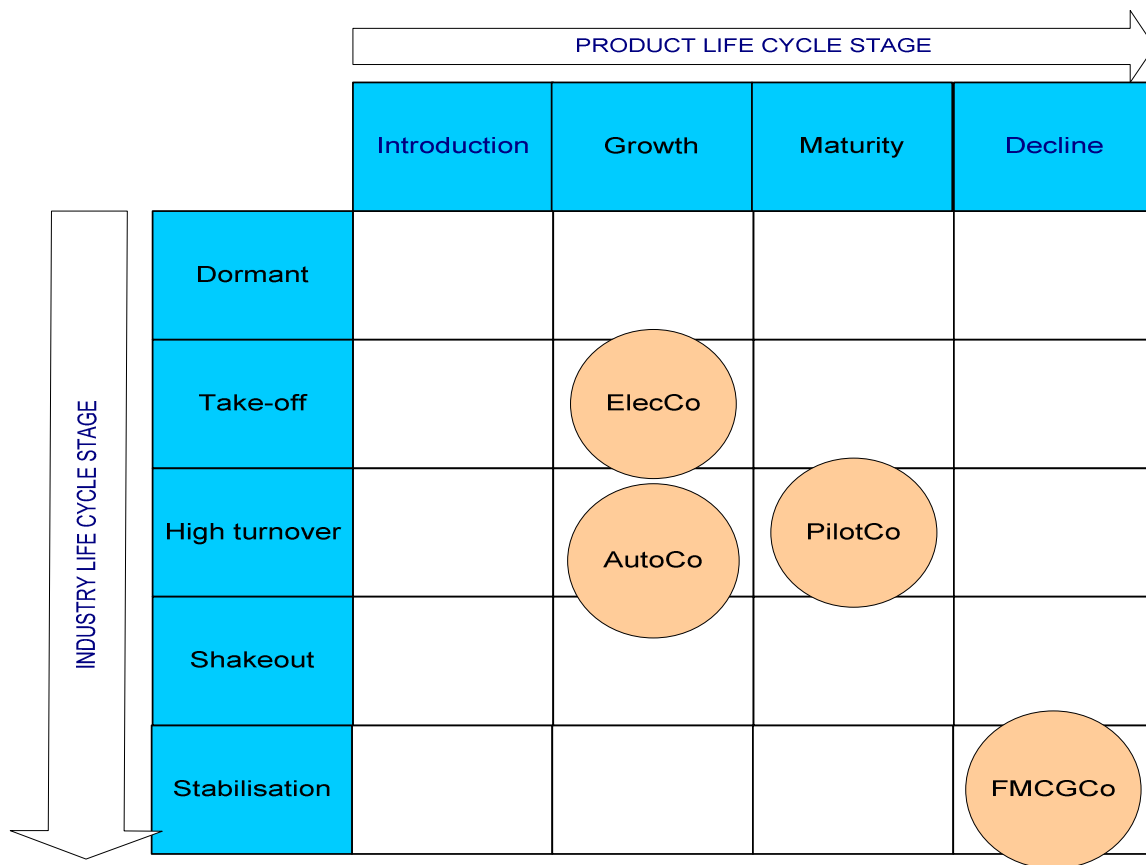


Figure 9-2: Product / Industry life cycle

9.4. Unit of analysis, Segmentation, Differentiation and BPMS

Identifying the appropriate unit of analysis provides a basis to set the business performance management system (BPMS) on. This was particularly made evident in AutoCo, ElecCo and FMCGCo as the buying patterns identified within each required differentiated response. In the case of ElecCo, the differentiating point in the organisation's operations should be at Engineering. If Engineering designs a platform of products for each segment, it would be possible to set appropriate operational targets to reflect the requirements of these segments in the form of product profiles, service profiles and buying pattern response. Likewise at AutoCo, differentiating its value streams to respond to the distinct buying patterns reflected in its customers' supply chains means that it can set appropriate targets within its factory rather than its aggregated measures of people, cell and machine performance (**Table 9-10**). Such an approach would not only leave the customers of ElecCo

and AutoCo satisfied but it would allow the organisations to be able to analyse profitability of each segment and recognise when to enter or exit particular segments hence an ability to respond appropriately. FMCGCo, on the other hand, was able to see the benefits of segregating its demand patterns and reflected this in the original design of its supply chain. Its subsequent redesign can also reflect this as some of its factories can be lean or agile. The move by PilotCo to one customer simplified its supply chain and meant that it could focus on improving factory efficiencies and launching products that complemented its strategy.

Findings from this research have shown that on an aggregated level businesses are unable to fully identify the root causes of poor performance because they use a ‘one size fits all’ approach to performance management. Rather than examine segment profitability and identify ways to grow margins in that segment by maximising efficiency in product/ service/ buying pattern requirements, they appear to automatically take steps to increase machine efficiency or push employees to work harder or worse, radical steps such as downsizing. While these steps may maximise shareholder value in the short-term, in the long-term they have a detrimental effect on both shareholder value and customer value. In the case of ElecCo, frequent downsizing had led to a fragmented and disoriented organisation. With PilotCo, it had lost sight of its customer’s priority of innovation above costs. In the case of AutoCo, attempts to use a lean response to an agile demand pattern led to overtime, high stocks, out stocks, shortage, missed deliveries and high costs. In this respect FMCGCo is a model case as it differentiated its manufacturing and delivery into lean and agile response where agility was used to respond to demand surge and new products (**Table 9-7** and **Table 9-8**). In such situations, targets cannot be the same as customer values are different. Also priorities in customer values for the same segment are likely to be different at each situation. Therefore the ability of an organisation to differentiate these needs to form appropriate response to these needs at each situation makes it dynamic. This means that to be dynamic, an organisation needs to segment and recognise scenarios that cause priorities in each segment to change in order to be able to respond to each of its segments at their different scenarios. This supports proposition four in **CHAPTER 4**.

Table 9-10: BPMS

	PilotCo	ElecCo	AutoCo	FMCGCo
Shareholder value metrics	Gross margin contribution, total operating profit	Gross margin contribution; market penetration;	EBIT; ROCE, penetration; cash flow	Operating profit; volume, market share; effective tax rate
Targets	Individual and functional except quality target that applies to all	Individual and functional except quality target that applies to all	Individual and functional except quality target that applies to all	Individual and functional
Reporting and review of performance	Proactive frequent reporting - hourly, daily, weekly, monthly, yearly with action plans	Ad hoc – has to be pulled	Daily, weekly to monthly with action but has to be pulled.	Weekly to monthly reporting with action plans
Data capture	Captured from shop floor and functions all the way up to management	On request	Pulled from shop floor and relevant staff.	Captured on shop floor, at Sales & operations planning meetings and on one to one basis
Unit of analysis Operational	Product, Customer	None	Machine, cell, people	N/A
Lifecycle	No set plans for review	Not reviewed	Reviewed annually along with strategy process	To be reviewed post strategy implementation

Relevance	Aligned to demand patterns, aligned to shareholder value.	Misaligned - fragmented measurement systems	Misaligned on a few set of measures but largely aligned to strategy Little dependency on BPMS for decision making on operations level	Mediocre dependency on BPMS for decision making
Implementation Incentives	Internal competition; Misaligned target setting; Fragmentation of ownership	Misaligned target setting; Fragmentation of ownership	Internal competition; Misaligned target setting; Fragmentation of ownership	Misaligned target setting; Fragmentation of ownership
Implementation Perceptions	Misaligned target setting; Fragmentation of ownership; Identifying appropriate customer segments; difficulty in executing new strategies	Misaligned target setting; Identifying appropriate customer segments; difficulty in executing new strategies; Demand uncertainty	Misaligned target setting; Fragmentation of ownership; Identifying appropriate customer segments; difficulty in executing new strategies; Demand uncertainty	Internal competition; Fragmentation of ownership; Identifying appropriate customer segments
Implementation Mechanisms	Internal competition; Misaligned target setting; Fragmentation of ownership; Identifying	Misaligned target setting; Fragmentation of ownership; Identifying appropriate customer	Misaligned target setting; Fragmentation of ownership; Identifying appropriate customer	Internal competition; Misaligned target setting; Fragmentation of ownership; Identifying

	appropriate customer segments; difficulty in executing new strategies;	segments; difficulty in executing new strategies; Demand uncertainty	segments; difficulty in executing new strategies uncertainty	appropriate customer segments; Demand uncertainty
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Table 9-11: BPMS quality

Quality	PilotCo	ElecCo	AutoCo	FMCGCo
Integrative	No – but cross functional reporting	No – multiple & independent systems	No – but cross functional reporting	No
Enabler to alignment	No – used for decision making that often sub-optimises a function.	Little importance placed on performance management	Emphasis placed on measures and not the performance monitoring process	Reviewing performance process post strategy implementation
User friendly	Yes with training pack to support	Complex and ad hoc use below level 3	Yes	Missing evidence
Enable focus on strategic objective	No – not part of the strategic objectives and largely based on operations	Not evident - multiple & disconnected performance systems	Yes – part of the annual strategy process	Not evident
Ability to track competitive advantage	No – responding to one customer need.	Not evident - Shareholder value measure does not take innovation into account	Yes	Yes in current factory system
Provokes appropriate	Yes for individual and functional measures	Yes for individual measures	Yes for shareholder measures	Yes fro process measures

feedback and response				
Timely	Proactive data capture and reporting	Often has to be sought after, ad hoc use	Yes but review historical data	Yes but historical data
Balanced measures	Balanced mix	Mostly shareholder value measures	Balanced mix	Balanced mix
Ability to recognise obsolescence	No indication but a process for including standard time for new products.	No indication -Review shareholder value measures (budgeting) with yearly strategic planning	Review performance system with annual strategy process	Not reviewed for a long time
Takes a broader scope	Not evident – but cross functional reporting allows visibility	Not evident	Not evident – cross functional reporting on management level	Market penetration and volume measures communicated

Table 9-12: Enablers and Inhibitors

Factors	PilotCo	ElecCo	AutoCo	FMCGCo
Demand uncertainty & variability → demand anticipation	✓	✓	✓	x
Supply chain flexibility	x	x	x	x
Integration of information, functions and organisations	x	✓	✓	✓
Timely flow of goods and information	✓	✓	✓	✓
Organisation structure – intra and inter organisational team, +fragmentation of ownership	✓	✓	✓	✓
Management methods	✓	✓	✓	✓
Culture and attitudes	✓	✓	✓	✓
Performance measurement + Shared goals, resources and benefits +fragmentation of ownership +misaligned target setting	✓	✓	✓	✓
Difficulty in executing new strategies → proficiency in strategy deployment	✓	✓	✓	✓
Understanding and identifying appropriate customer segments	✓	✓	✓	✓

✓ - Strong evidence for being a factor X – No strong evidence for being an enabler or inhibitor

9.5. BPMS, Enablers and Inhibitors

As discussed in the previous section, the unit of analysis should also form the basis of the BPMS. At the operational levels of an organisation, the BPMS needs to be segregated into value segments to encourage the right behaviours for each segment and at senior managerial levels it can be aggregated such that optimal shareholder value and customer value is achieved. From the study, there was a consistent gap in all cases in the use of value segments as a unit of analysis of the BPMS. In all cases except AutoCo business performance management was not even part of the strategy process. AutoCo recognised the importance of a BPMS for driving behaviours but its gap in using a ‘one size fits all’ approach meant that optimal shareholder value and customer value were not being realised. In the case of PilotCo, this proved irrelevant as PilotCo had moved to serving one customer that had the same buying patterns for all the products it procured from PilotCo. Both cases had strong performance related management and were dependent on their BPMS for decision making. However despite having strengths in their performance management approach, particularly PilotCo which had the opportunity to close the gaps in its system, there was still sub-optimisation in their systems. This indicated that the design and lifecycle monitoring of targets, metrics, reporting and relevance are necessary elements that need to be present in a BPMS but not sufficient in provoking aligned behaviours. The manner in which each element is managed plays a role as well as other enablers and inhibitors. This supports the sixth proposition in **CHAPTER 4** that suggests that having an integrative BPMS would create this alignment but it disputes the fifth proposition that all elements of a BPMS have to be present to enable alignment. Interestingly, although the integrative aspect of a BPMS has been identified as its most important quality for enabling alignment, it is the least practiced (**Table 9-11**). The key inhibitors to an integrative BPMS as found consistently across all cases are fragmentation of ownership and misaligned target setting. These inhibitors were the result of perceptions on best practice approach to performance management, the mechanisms used to deploy it and the incentives that were linked to it.

Internal competition appeared to be provoked by management style and contributed along with the two aforementioned inhibitors to sub-optimisation within the organisations. On reflection it was found that the implementation factors do not vary

significantly from the identified enabling/ inhibiting factors, rather they were found to have causal relationships and also have a big role in creating behavioural alignment as well as enhance efficiencies in decision making in the strategy and supply chain processes thus enabling responsiveness. For this reason they have been regrouped and **Figure 9-3** is the resulting causal relationship identified from the study.

There was no strong evidence of supply chain flexibility being an enabler or an inhibitor (**Table 9-12**) so it has been removed from the list. Also difficulty in executing new strategies has been redefined as ‘proficiency in strategy deployment’ while demand uncertainty and variability have been redefined as ‘demand anticipation’.

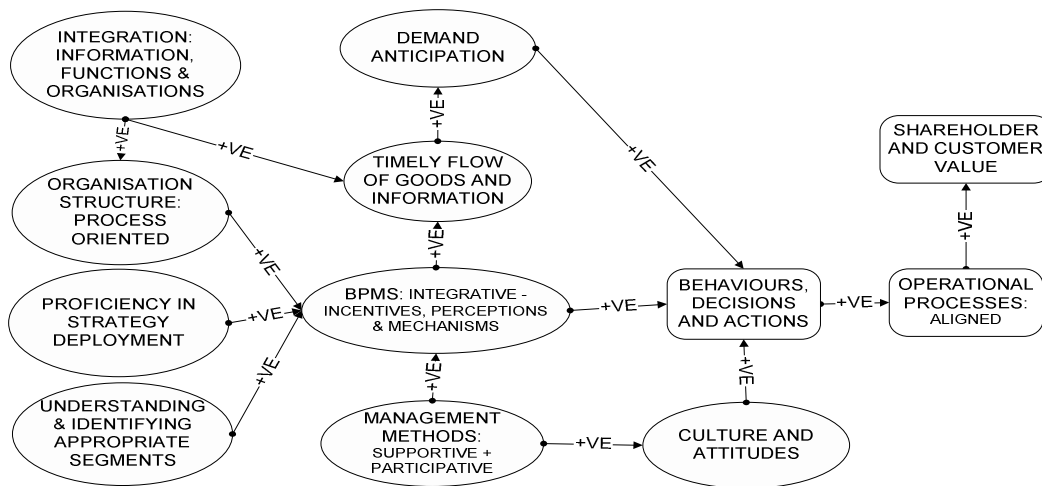


Figure 9-3: Enabling responsiveness

Findings from this study therefore indicate that proposition five and six should instead be amended to state that ‘shareholder value and customer value need to be built into strategic objectives that are in turn translated into a BPMS to effect the behaviours, decisions and actions that ultimately lead to alignment (value creation) or misalignment (value lost). All elements of this process including the BPMS elements do not only have to be present in order to enable this alignment but need to be designed to be integrative and managed in the same manner. This means shared measures, shared action plans, process targets and reporting with stakeholders that fall under its unit of analysis.’ To add to this BPMS implementation factors, enablers and inhibitors have highlighted the importance of behavioural alignment. This is because in their design they create the incentives, perceptions and mechanisms that can lead to behaviours,

decisions and actions that ultimately lead to shareholder value and customer value creation. Therefore the seventh proposition in chapter 4 needs to be amended to state that ‘the factors represented on **Figure 9-3** are necessary and sufficient factors for an organisation or supply chain to consider when determining an appropriate response to its market.’ Each of these factors are necessary but are not by themselves sufficient. For example, PilotCo eliminated the need to segment by moving to one customer. It also managed the conflict between its NPD and production functions via cross functional reporting where daily priorities were set rather than introduce shared targets between the two that would have altogether eliminated the conflict. At ElecCo, facility and geographical constraints meant that cross-functional teams could not be co-located so a formalised reporting process could ensure the timely flow of information.

9.6. Other Findings

Fragmentation of ownership versus lack of accountability: At PilotCo, ElecCo and AutoCo, top management were resistant to sharing targets as they believed that targets had to be within a job owners control and shared targets would lead to a lack of accountability. It is interesting that at a managerial level, shared targets exist and allow a broader view to be taken whilst at an operational level, it is not seen as something feasible. Moreover the era of total quality management introduced the concept that everybody is responsible for quality and this had led quality to be a customer need that is no longer differentiating advantage but a given. The case of PilotCo also supported the concept of shared targets as waste management became more effective as a result. Fragmentation is an inhibitor as it creates more interfaces and at every interface value is either created, maintained or lost. In order to ensure that strategic objectives are still being met at each interface there is a need for integrative /shared /aligned measures and targets. Shared targets allow greater emphasis to be given to total organisational/ supply chain effectiveness and the role of fragmented areas in contributing to it. For them to work, fragmented areas need to be measured and rewarded on the basis of their contributions to the total effort rather than their individual effectiveness. This can mean giving rewards or recognition for helping each other to achieve targets.

Customer influencing or responsiveness: At FMCGCo it was believed that Tier One customers would tend to change specifications and thus introducing variety, claiming that it is what the customer wanted. This created difficult forecasting and scheduling

and a lack on constancy in products at the factory. The increasing product variety was driven by a need to grow revenues at marketing but yet introduced non-consumer relevant complexities in the system. The new centralised strategy demands behavioural change from its customers. Likewise in the case of AutoCo, the BMW supply chain was an interesting one in that it was limiting supply to prevent its cars becoming near commodity and give cachet to its brand. At the same time it meant it could realise efficiencies by operating at maximum capacities and only growing capacity with the size of the market. In both cases customers have been influenced to purchase in a particular way. While Tier Ones at FMCGCo may not have a choice, it remains to be seen if this hole that BMW has left in the market place could be inviting Toyota to fill it.

Internal alignment enables external alignment: All cases support the finding that an organisation has to be aligned internally before it can align externally. The number of issues identified at PilotCo and ElecCo made it impossible to for the organisations to focus on external issues particularly with suppliers. In most situations customers are in a stronger position to place requirements on their suppliers but they cannot do this if they do not know what their requirements are of the supplier. Therefore findings from this research propose that organisations should firstly align internally, and then align downstream with customers before finally aligning upstream with suppliers. It is proposed that aligning upstream with suppliers only makes sense before aligning downstream with customers in an economic condition where demand exceeds supply and the organisation needs to secure favourable sources or in a monopoly where it can ensure efficient supply methods and influence customer buying patterns.

Best practice – a misnomer?: The findings also showcased two instances where ‘best practice’ proved to be a misnomer. At ElecCo, the approach to supplier management where it rationalised its suppliers from smaller multiple local suppliers of which ElecCo was about 80% of their account to big multinationals of which its account had little priority. The local suppliers were more agile and provided the opportunity to fix problems quicker as they were closer whereas the big players were more domineering and their unfamiliarity with ElecCo’s products made them penalise ElecCo for the complexity. In AutoCo’s case the forward integrator who is consolidating orders to Tier One B where frequent daily deliveries were expected. Also AutoCo’s ‘smoothing’

of demand, although based on the assumption / belief that all customer needs were the same or various customer needs can be served through the same supply chain, did not work for the supply chain of Jaguar. One of the root causes for this was that operational managers are often too focussed on day to day performance to sit back and strategise for the future or take a broader scope to ensure alignment of current strategy with organisational needs. In all these instances, the default approaches of the functional areas to assume best practice were the result of misaligned objectives that led to loss in shareholder value and customer value.

Value disciplines: The value disciplines proposed by Treacy and Wiersema (Treacy and Wiersema, 1993) provide a good way to view the competitive options and were used as a primary variable for picking the cases (**Figure 3-6** and **Table 4-9**). However, they were found to be unsatisfactory and especially when put in the competitive context. Each of the cases despite their stages in the industry lifecycle (**Figure 9-2**) believed that their differentiating characteristic from their competitor was in product leadership. There are service profiles associated with physical product supply chains that also help in differentiating from competitors which means that an organisation can devise a cocktail of hybrid propositions to differentiate itself from its competitors. This was particularly evident in the competitiveness of ElecCo (**Table 6-5**). Alternatively, at AutoCo operations excellence was a prerequisite to compete in such a market meaning that in devising such a hybrid proposition to differentiate from the competition, an organisation would need to recognise which value disciplines are qualifiers to play in a market and which value disciplines could potentially make them winners in that market.

9.7. Implications of Cross-Case Findings and Conclusions

The author initially set out to investigate the proposed market responsiveness model with fixed descriptions of what was expected at the focal organisations and their supply chains but what was found was different. The organisations did not quite fit into the pre-described taxonomies and characterising them on the basis of volume/ variety did not appear to have an impact on the design of the model. The cross-case data tables in this chapter show these in the form of product /industry lifecycle stages, varied unit of analysis of each case and different industries with firms of different size pursuing different strategic goals. This means that the model cannot prescribe context specific designs for the industries or case variables presented but rather provides a generic

means for enabling an organisation to design a response to a targeted market. This generic aspect is further enhanced by the different stages in the strategic process each case was at and which tools of the market responsiveness model was most relevant to it as a result. PilotCo was observed from strategy formulation through to implementation and post-implementation; ElecCo was at strategy formulation making it strong for assessing firm orientation and competitiveness; AutoCo was at steady continuous improvement state making it strong for looking at strategic alignment, process alignment and consequent response to market; Finally FMCGCo was at strategy implementation which made it strong for observing enablers and inhibitors. The same approach was used for all and it yielded a lot of insight; a specific one being that organisations struggle with 'how to' and this research potentially provides an approach. As a result each case provoked the need to design, define and use tools such as relationship maps, value gaps templates, process mapping and decision mapping as a means to help managers design an appropriate response for their business. The underlying principle for achieving the appropriate response in all cases was designing the BPMS to drive the right behaviours, decisions and actions that will lead to the creation of optimal shareholder and customer value (**Figure 9-3**).

CHAPTER 10.

Discussion

The purpose of *Chapter 10: Discussion* is

- To provide a summary of the research findings and to make explicit the theoretical enhancements that has been made to the Market Responsiveness Framework as a result of empirical testing.

10.1. Presenting a Market Responsiveness Model

Table 10-1 is a summary of all the findings from the research and they will be used for the basis of discussion in this section as well as develop a roadmap for the market responsiveness model.

Table 10-1: Summary of findings - supported (✓), (-) not evident or not tested

Findings	PilotCo	ElecCo	AutoCo	FMCGCo
Internal alignment precedes external alignment	✓	✓	✓	✓
Behavioural alignment is key to achieving responsiveness.	✓	✓	✓	✓
Incentives, perceptions and mechanisms → behavioural alignment	✓	✓	✓	✓
Shared targets → different groups will work together and therefore align better	✓	-	✓	-
Causality between BPMS implementation factors and Enablers and Inhibitors	✓	✓	✓	✓
Value execution point	✓	✓	✓	✓
Value gaps exist at interfaces in an organisation/ supply chain where value is potentially created, maintained or lost.	✓	✓	✓	✓

Findings - continued	PilotCo	ElecCo	AutoCo	FMCGCo
Unit of analysis of supply chain , segment & BPMS Value segment is the appropriate unit of analysis for a BPMS	✓	✓	✓	✓
Customer values are not static	✓	✓	✓	✓
Design and lifecycle of BPMS: elements need to be reviewed when change in strategy, redefined segments and product lifecycle stage	✓	✓	✓	✓
Value gaps due to misalignment with the market can still exist even when internally aligned.	-	-	✓	-
Power balances change further upstream a supply chain and favours suppliers as there is more competition for resources from other industries	-	-	✓	-
Influence or respond to customer?	-	-	✓	✓
Brand value aligned to supply chain	-	-	✓	-
Operational levers to align supply with demand	✓	✓	✓	✓
Information sharing/ reporting between dispersed entities need to be formalised.	✓	✓	✓	✓
Performance targets need to be differentiated for varying types of response	-	✓	✓	✓
Enablers and inhibitors – mostly supported	✓	✓	✓	✓
Strategy flow:	✓	✓	✓	✓
Core competence thinking is internally focussed.	-	✓	-	-

Findings - continued	PilotCo	ElecCo	AutoCo	FMCGCo
Treacy & Wiersema's value disciplines require product and service profile	-	✓	✓	✓
Shareholder value and long-term orientation	✓	✓	✓	✓
Being 'integrative' is the most desirable nature of a BPMS that will enable responsiveness	✓	✓	✓	✓
Group targets may not be appropriate for all operating companies.	-	✓	✓	-
Ownership & accountability levels	✓	✓	✓	✓
Message lost in strategy deployment – unidirectional, functional fragmentation in deployment	✓	✓	✓	✓
Staff default to what's considered best practice in areas of expertise when lack strategic direction	✓	✓	-	✓
Best practice a misnomer?	✓	✓	✓	✓
Outsourcing requires clear objectives	-	✓	-	-

The research set out to formulate and test the feasibility of a market responsiveness model that will enable organisations to make strategic decisions that will make them competitive in the long-term. The initial model conceived from literature consisted of the following basic principles that have been enhanced by the findings on **Table 10-1** to create the new model depicted on **Figure 10-1**.

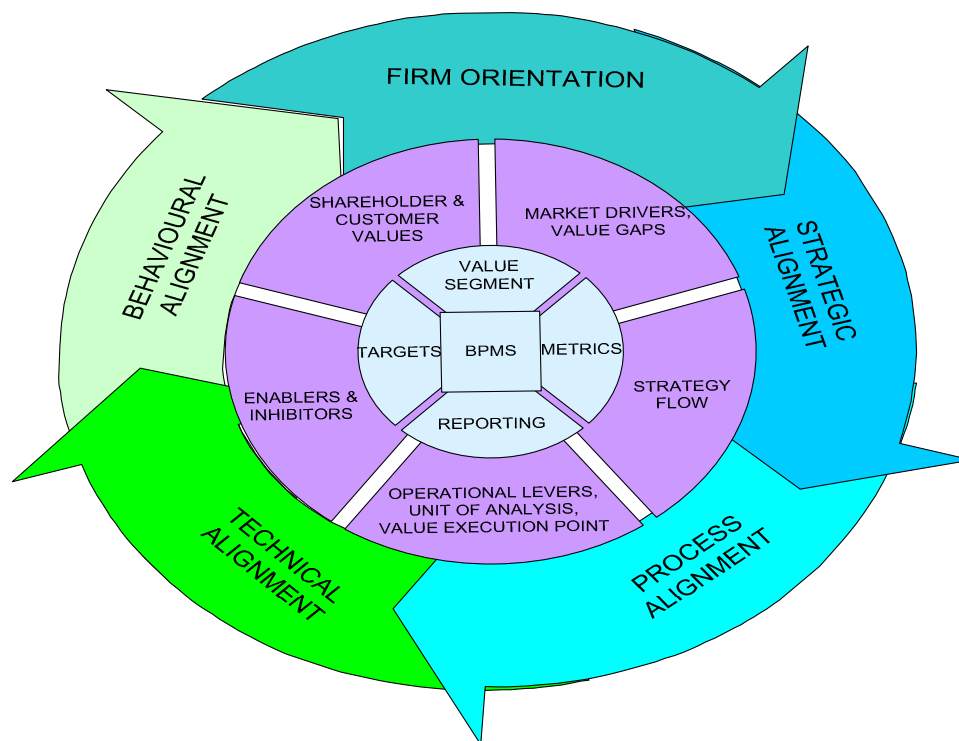


Figure 10-1: Market responsiveness model

1) *Firm orientation and competitiveness*: This looks at the relationship of the firm with its owners to firstly identify the motive of the organisation. Other stakeholders are considered in as far as they have an impact on creating shareholder value. The findings on shareholder value being a primary objective indicate that given an option or monopolistic situation organisations would take advantage to maximise shareholder value. However a primary objective of shareholder value creation does not necessarily mean short-term orientation. The findings from the research (ElecCo) indicate that senior managers are interested in long-term survival and often it is pressure from their corporate group that causes them to be short-term focused. Short term orientation was found to lead to decisions that had a detrimental effect on all stakeholder values and competitiveness. Since the study is scoped around for-profit organisations, competitiveness has been defined as the ability to

appropriate maximum shareholder value and customer value. Treacy & Wiersema's (1993) value discipline was used to analyse the competitive options available to the organisation by comparing its service and product capabilities with its competitors. **Table 10-2** provides a revised version of this. This helps to establish competitive gaps in value segments that the organisation needs to fill in order to remain competitive and these can be built into the strategic objectives.

Table 10-2: Building on Treacy & Wiersema (1993)

		Service profile		
		Operations excellence	Product leadership	Customer intimacy
Product profile	Operations excellence			
	Product leadership			
	Customer intimacy			

2) *Strategy flow*: Strategic objectives need to be devised for every value segment that the organisation has decided to target. It also has to include customer value and shareholder value targets for each of the value segments. These strategic objectives are deployed through the organisation following the convention on the strategy flow diagram (**Figure 10-2** and **Table 10-3**) that also helps to identify the appropriate decision variables and their impact on functional strategies. These have implications for functions in the organisation **Table 10-4** and indicate potential areas the organisation needs to focus on to maximise shareholder value and customer value – the value execution point. Findings from the research indicate that organisations tend to focus improvements away from what they deem to be their key contributing function. However this research suggests that it is in such places that maximum value can be realised. Recognising these implications means that all other functions in the organisation will be aligned to support the objectives because the findings from the research show that employees revert to what they consider to be best

practice in their field of expertise without such direction. For example, NPD could be introducing non-consumer relevant complexities to operations by creating new variants of a product as a means to achieve its objectives but those objectives could be contrary to an operations excellence value segment. **Table 10-4** gives an idea of the implications of a strategic pursuit on functions within an organisation. The research found that in reality an organisation's strategy is not locked in one value discipline so an organisation would need to devise a similar template to match its catalogue of offers for identified value segments. Further **Figure 10-4** is a finding from the research and suggests operational design decisions that need to be aligned with the needs of a value segment.

Formulating strategy in this manner ensures that interdependencies between strategic functions are captured. Although the flow has been discussed from business strategy to product strategy, it is not intended to imply that one is more important than the other or one is at a higher level than the other. It can be performed from either direction because an organisation whose uniqueness is its product would want to design its functional strategies around its product, making its product the unit of analysis.

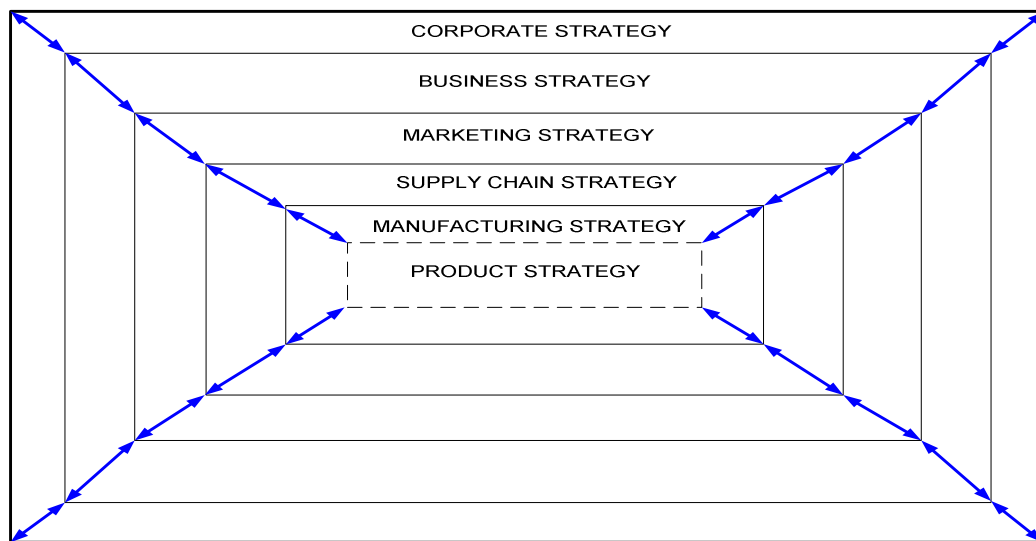


Figure 10-2: Strategy flow diagram

A further implication of following the strategy flow variables (**Table 10-3**) is that an organisation (or business unit) can configure its supply chain accordingly in a way that allows it to appropriate maximum value as shown on **Figure 10-3** below. Such that it

moves from a 'one size fits all' to a multiple configured organisation that has its internal supply chain functions differentiated according to the needs of its value segments.

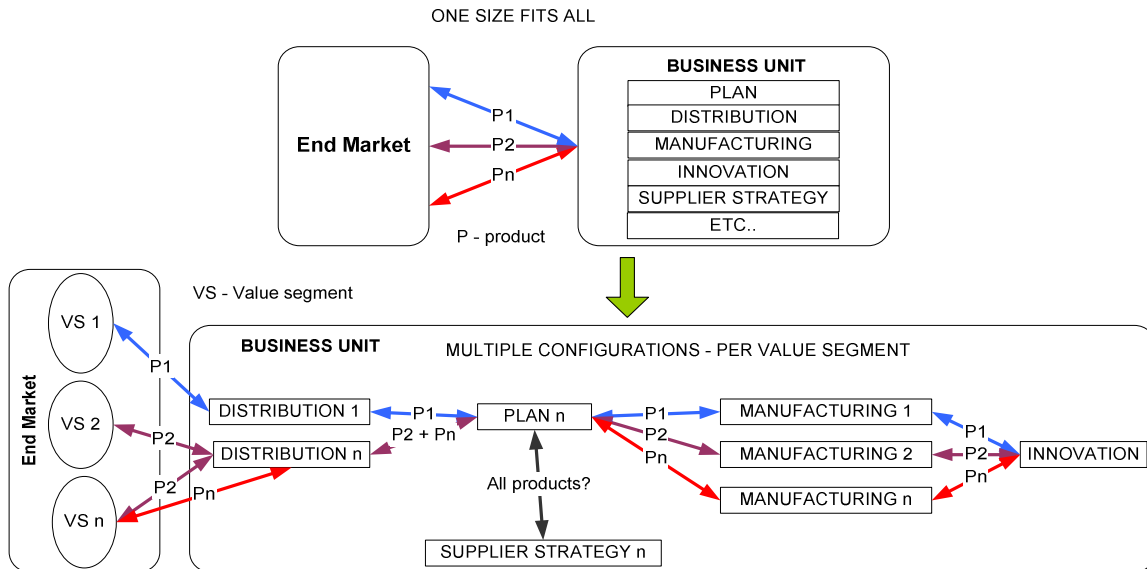


Figure 10-3: From 'one size fits all' to multiple configurations

Table 10-3: Identifying strategy flow variables

Differentiating points	Differentiating criteria	Variables
Corporate strategy	How do we organise ourselves to sell to our markets?	Business units – by customer/ region/ product?
Business unit	What customers do we sell our products to?	Market segments - by customer, product type, region?
Market strategy	How do we organise ourselves to sell our products to our targeted market?	Value segments - account size, strategic partners, buying patterns, demand types, branding, location?
Supply chain:	How do we organise ourselves to respond to the product needs, buying patterns / demand types exhibited by the value segments identified by marketing? (Table 10-4 and Figure 10-4)	Value segmented supply chain strategies: Speed, flexibility, costs, products → lean / agile or hybrid strategy? If hybrid strategy: differentiated plan/ delivery/ supplier strategies?
Manufacturing strategy	How do we organise our processes to respond to the product flow demanded by the supply chain strategy and the complexities of the product?	Value segmented processes - lean, agile, cellular, Any synergies with other value segments?
Product strategy	How do we continue to deliver value to the value segment through our products to grow revenues?	Value segment - segment only products, segment only features or variants, lifecycle
Supplier strategy	How do we align our suppliers to match the features and patterns of material flow we require?	Co-development, VMI, MTO, multiple source, in-source, outsource?

Table 10-4: Implications for intra-organisational supply chain alignment

	CUSTOMER INTIMACY	PRODUCT LEADERSHIP	OPERATIONS EXCELLENCE
Decision variables	Primarily flexibility	Primarily speed to market related	Primarily cost related
Customers	Want customised products	Want latest technology	Want cheapest product
Operations	Job shop - Project based manufacturing/ approach. Pulled by customer – unpredictable	Agility - with batch manufacturing with facilities to pilot test. Push limited supply into markets	VEP: Lean / mass - cost effective production methods. Push/pull Stable demand – base/surge
NPD	Develop specific and individual solutions for customer.	VEP: Leading edge innovations /Short product lifecycle	Incremental innovations
Marketing	VEP: Build close relationships & portfolios of customers to understand needs.	Identify niche and raise customer awareness of potential products	Convince market of best price for product quality.
HR	Flexible staff	Creative people	Staff happy with repetitiveness
Purchasing/Suppliers	MTO suppliers near by	Co-development/ partnership	VMI suppliers
Performance Management	Project based costing with high margins built in, delivery reliability, customer profitability	Prioritise speed to market, short lead times, success of new innovations, cost to develop	Waste reduction, high efficiencies and productivity, high inventory turns, high utilisation
Shareholder value	Focus main activities on best design of marketing function	Focus main activities on best design of NPD function	Focus main activities on best design of manufacturing function

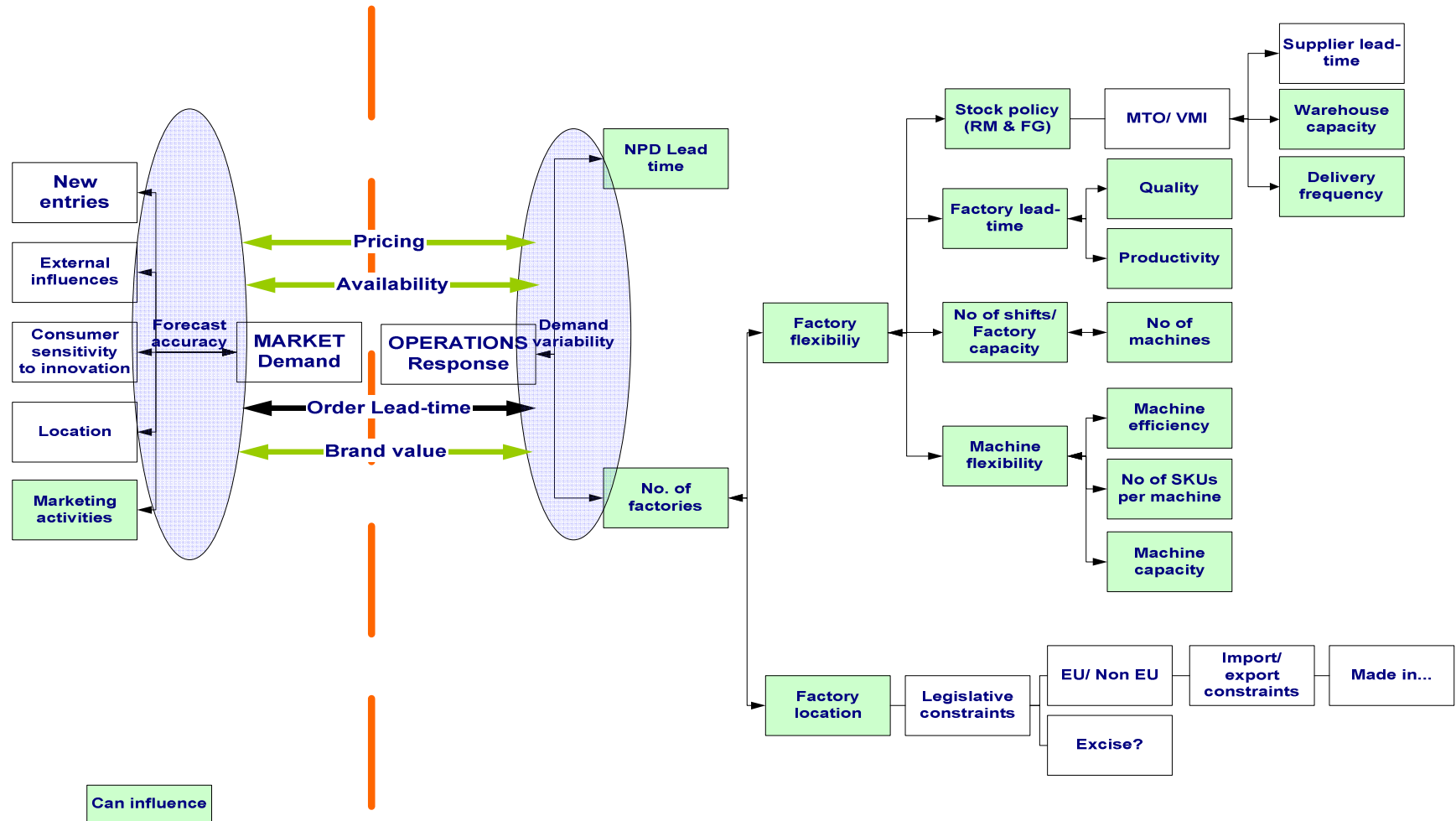


Figure 10-4: Operational levers to align supply with demand

3) *Business Performance Management System (BPMS)*: Once the strategy has been formulated it needs to be deployed (**Figure 10-5**) in a manner that ensures potential value gaps are closed (**Figure 10-6**). Value gaps are interfaces within an organisation / supply chain where value is potentially created, maintained or lost, meaning that the shareholder and customer values built into the strategic plans being cascaded could be damaged through poor deployment. Value gaps can exist at hierarchical levels, between functions, individuals and even financial centres (e.g. cost centres).

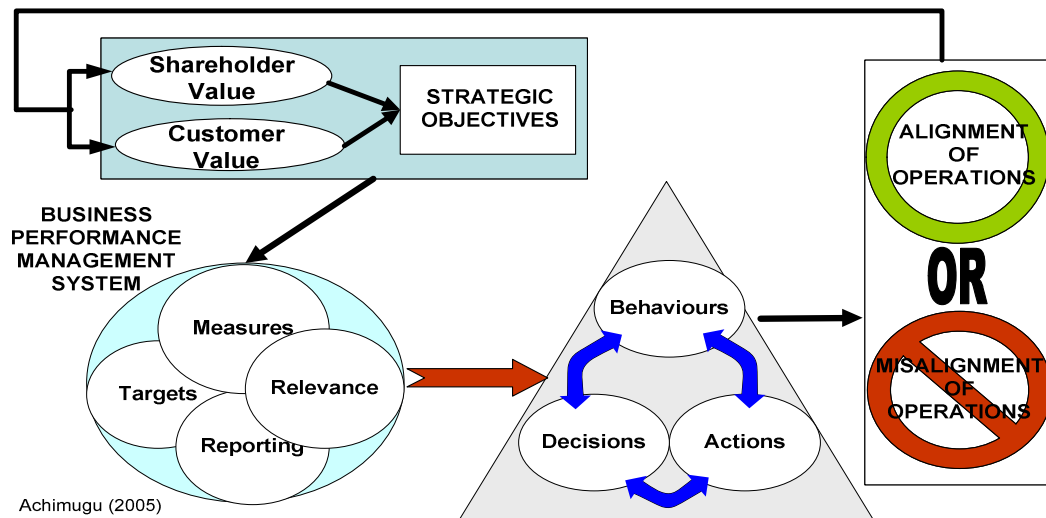


Figure 10-5: Enabling responsiveness

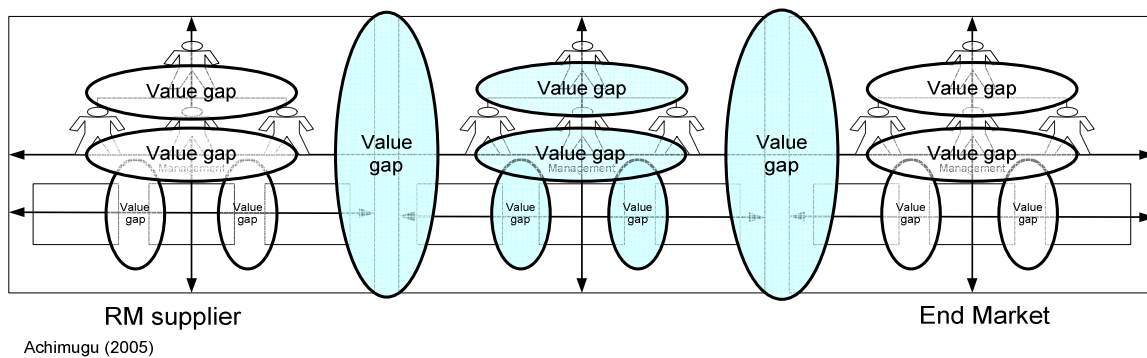


Figure 10-6: Value gaps in strategy deployment

The stakeholders are different at each value gap so the deployment process needs to be repeated at each value gap. Strategy maps can be used at inter-organisational value gaps to ensure alignment with the other organisation's objectives and it is recommended that

internal alignment is achieved before the philosophy should be extended to external suppliers and customers.

As part of the deployment, the strategic objectives need to be transformed into a BPMS. A BPMS is defined by its constituents on **Figure 10-7**. The unit of analysis of the BPMS should be the value segment. This means that at operational levels there could be multiple BPMSs, depending on the number of value segments identified from the previous step, and these are aggregated as the information travels up the hierarchy (**Figure 10-8**). This means targets, metrics and reporting are process based and so allow co-ordination between functions rather than sub-optimisation. Further it allows the organisation to analyse segment performance to know which segments they can grow and which segments they need to exit meaning that optimal shareholder value and customer value is created.

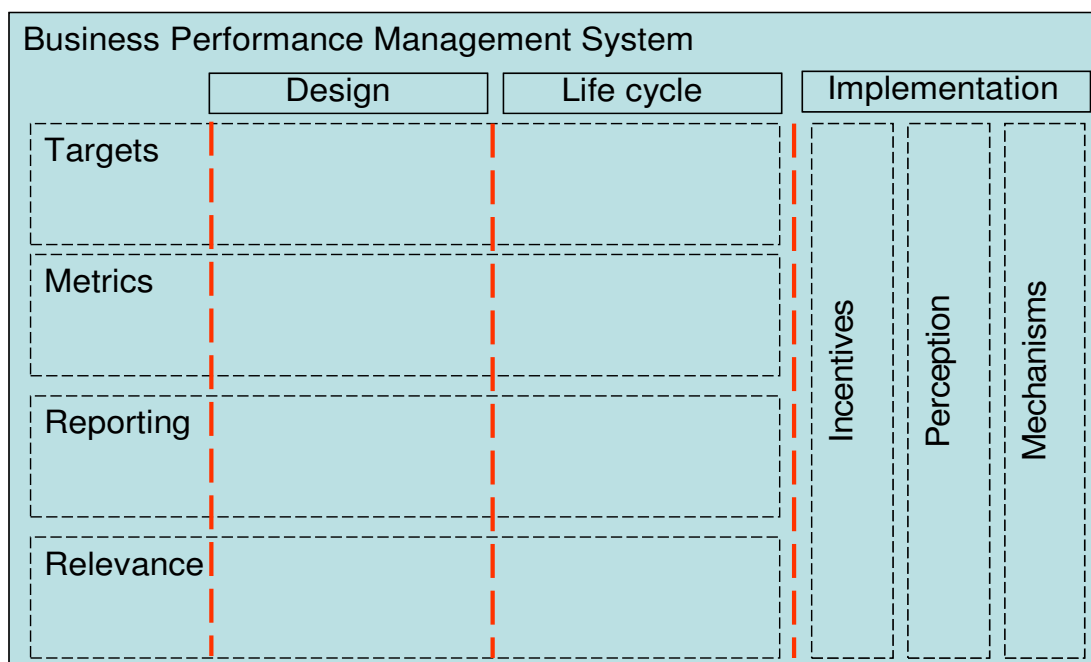


Figure 10-7: BPMS framework

4) *Enablers and Inhibitors*: As suggested in (**Figure 10-8**) moving to this new way of working requires changes in the infrastructure, incentives and culture of an organisation. This is why the enablers are important. The enablers ease behavioural alignment and also make the processes described in the previous steps more efficient (**Figure 10-9**).

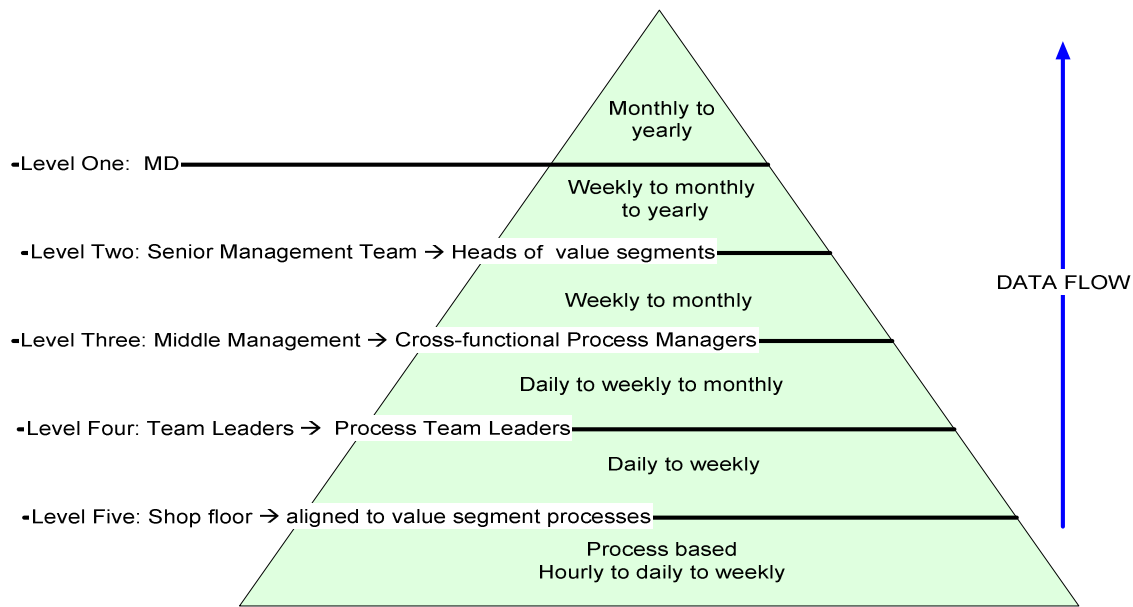


Figure 10-8: Example of BPMS levels

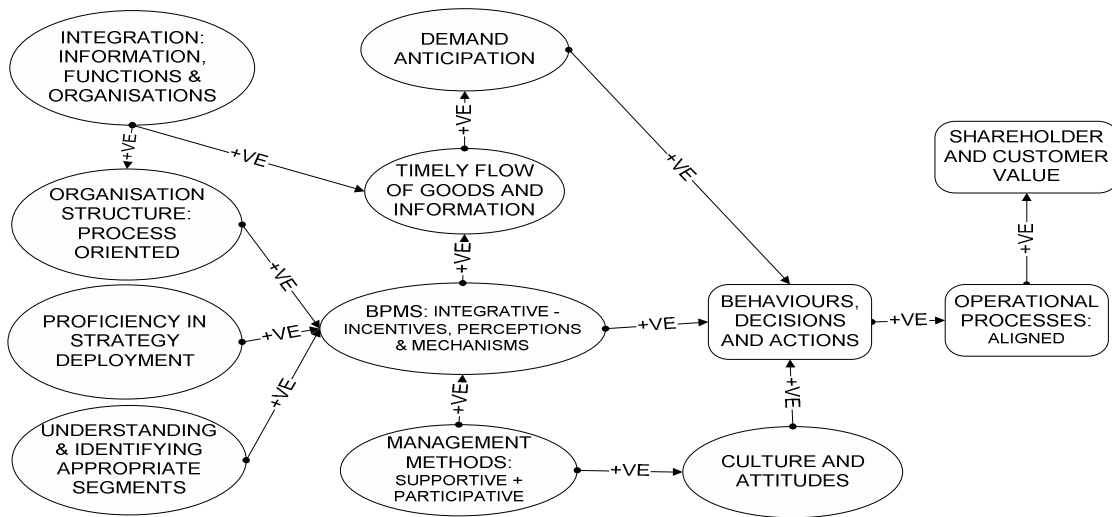


Figure 10-9: Enabling responsiveness

The prescribed steps in this section have described an iteration of the market responsiveness model. Market needs are dynamic and constantly changing and so it is important for organisations to be able to recognise triggers for response that will mean the whole process is repeated. These triggers for response can include: shifts in the industry/ product lifecycle stage, redefined value segments, moves by competitors, new strategy and

other changes in market drivers that have an impact on demand patterns. Repeating the whole process is made easier and faster if the organisation is already well aligned hence the importance of enablers. Also the nature of the process is such that it can be used for auditing and the process can be started at any stage. **Figure 10-1** summarises the final version of the market responsiveness model. It shows that responsiveness requires the alignment of firm orientation, strategy, supply chain processes, technical (IT systems) and behaviours to a value segment. This alignment is coordinated by a BPMS and supported by the objectives (optimal shareholder value and customer value), various factors and tools.

CHAPTER 11.**Research Contributions and Further Work**

"Ultimately a man sets the measure of his own freedom and his own bondage by the level at which he chooses to establish his convictions." - (George Kelly, 1955)

The purpose of *Chapter 11: Research Contributions & Further Work* is

- To make explicit the theoretical contributions; methodological and practical contributions with reference to the shortcomings of the research, gaps and also highlight future work.

11.1. Research Contributions

The length of study allowed in-depth analysis of four distinctive supply chains and the data collection was limited to business-to-business contexts. The study was originally designed in **CHAPTER 3** to use a combined case study-action research method whereby the first phase (case study) is spent collecting data that is analysed and presented back to the case companies in Phase Two for implementation (action research). However in from the pilot case in **CHAPTER 5** this approach was found to be very time consuming and the changing situation at PilotCo meant that data gathered in the latter stages were less attributable to the change implemented. Thus for the other cases the time was shortened from eighteen months to three months meaning that these studies became more inclined towards case study method. Nevertheless, using a combined case study-action research method allowed the collection of rich data that was used to analyse the underlying mechanisms behind the concept of responsiveness. This means that while the study is high in ecological validity the generalisability of the study is limited to similar settings. These limitations should be considered when interpreting the results.

Over the last 20 years, the concept of supply chain management has been gaining ground in literature with practice somewhat lagging. In this respect, this research has attempted to

close the gap between theory and practice. By asking a 'how' question, it has not only investigated theory but looked at ways theory can be put to practice. Thus its primary contribution is in providing a process for organisations involved in the management of supply chains to assess and align their supply chains to the market place in order to maximise shareholder value whilst delivering customer value. The approach taken has also resulted in a number of theoretical and methodological contributions.

11.1.1. Theoretical Contributions

Supply chain management is a broad subject area and this broadness is reflected in the diverse literature review. To add to this using the combined method describe above meant a lot of rich data was captured and it is for this reason that theoretical contributions reflect the diverse aspects of responsiveness.

Market responsiveness model: This is the primary contribution of this research. The model provides a focused approach for managers to identify and rectify issues to do with responding to their markets. It is dynamic enough to accommodate the changing needs of customers and market influences. Its uniqueness is in its combination of strategic, process, technical and behavioural alignment. It has been tested in four distinctive organisation settings and has proved useful in identifying key issues for the top management agenda despite the multiple variables. This indicates that it is generic.

Enablers and inhibitors: The research has contributed to growing literature in enablers to responsiveness by adding some causality to factors identified from literature and testing them.

Scope of research: Most literature in supply chain research is typically focussed on dyadic relationships. This research has developed a model and tested it beyond a typical dyadic relationship of a customer and supplier as a means to seek current supply chain practice and adding to its rich data source. This enhances the uniqueness of the model.

Strategy flow: the strategy flow aspect of the model provides a unique way of identifying appropriate value segments for a supply chain. This is because current methods in literature do not take into consideration the impact such designs can have on aligning

functional strategies within the organisation. This provides the unit of analysis for a supply chain and allows an organisation to be able to design its processes to deliver maximum shareholder value and customer value thus remaining competitive.

Value disciplines: The intense competition in today's markets means that organisations have exploited competitiveness to the point of evolving Treacy and Wiersema's (1993) matrix. Today it is no longer sufficient to be strong in one or two of the disciplines, rather an organisation would need to form hybrid strategies based on using them along product and service profiles. For example, in the food retailing industry, there are little differences between Sainsbury and Tesco now – both have economy, standard, premium and other niche ranges. This puts their competition down to price, location, convenience, and other strengths such as corporate social responsibility. This makes having the value disciplines a qualifier to compete in such a market.

Value gaps: The research has generated new theory in the form of value gaps. Value gaps are interfaces within an organisation or a supply chain where value can be either created or maintained or lost (see previous section).

Value execution point: Another theory generated is the concept of the value execution point (**Section 9.2.1**). This is a useful concept because identifying the value execution point within an organisation enables it to focus all areas of the organisation to that point to enhance shareholder value and customer value.

Integrative performance management model: Currently in both literature and practice, attempts to measure supply chain performance have taken unidirectional approaches where customers expend a lot of effort measuring their suppliers (how good they think their suppliers are) and those suppliers likewise measure themselves (how good they think they are). This research proposes an alternative approach of which both parties get together to decide what needs to be measured, which point in the supply chain should the data be collected, what system should it be put into and who it should be distributed to. This makes it integrative and saves duplication. Existing performance management models such as the balanced scorecard and performance prism are internally focused and have been designed

to be so. Extending these notions to supply chains also means that performance management would be unidirectional.

Behavioural alignment model: In attempts to encourage inter-organisational coordination some areas of research have introduced ways of measuring coordination or collaboration which this research believes is time consuming, costly and drives wrong behaviours. The reason why there is a lack of coordination is in the lack of a behavioural alignment aspect in most supply chain models. The model presented in this research is an attempt to alleviate this gap in research by emphasising behaviours and decisions. Decisions reinforce behaviours and behaviours reinforce decisions. Behaviours and decisions consequently lead to actions that may further reinforce both decisions and behaviours and also lead to alignment or misalignment of operations. The output of these processes determines if the organisation has met the strategic objectives / needs of the external environment. In practice, for-profit organisations would not be interested in measuring how coordinated they are. Performance management is already a costly process. Their real pressure is in delivering customer value and shareholder value. This model measures responsiveness on the basis of capabilities and value created. It provides a way of coordinating whilst at the same time delivering shareholder value and customer value. Most models in supply chain performance management do not include a shareholder value aspect nor do they explicitly consider enablers & inhibitors (**Figure 10-9**) or the ‘soft’ aspects of managing supply chain responsiveness.

Segmented BPMS: A ‘one size fits all’ approach to performance management appears to be the practice. Performance measurement should be specific to the defined value segments that have been designed to deliver customer value and shareholder value. By designing the BPMS along the supply chain of a value segment, processes are measured for their effectiveness in delivering value and not people. This way steps are taken to improve processes at all levels of the business. This implies organisational structures that are process based as depicted on **Figure 10-8**. Thus shareholder value is managed along a value segment process.

BPMS Framework: Most research into performance management in supply chains focuses on prescribing a list of metrics or a range of them that should be used in managing supply chains without integrating them into a strategy process. Bititci et al. (2005) offer a similar approach but it is focused on maximising shareholder value in extended enterprises and it is neither about supply chains nor about creating customer value. Details of BPMS findings can be found in **CHAPTER 9**. Having all elements of BPMS are necessary but not sufficient for using a BPMS to align behaviours. It is the way that it is implemented and used and the way targets are set, hence the drive for shared / process targets. However organisations are resistant to shared targets for fear of lack of accountability so they fragment ownership areas. This increases value gaps. Figure 11-1 is a contribution to enhancing alignment when such constraints inhibit teams from working closer together.

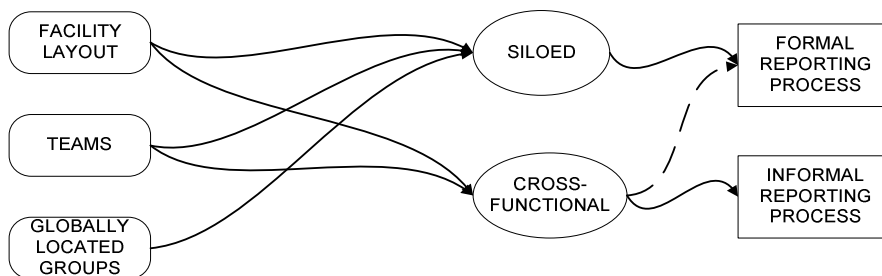


Figure 11-1: Formalised reporting

Life cycle of BPMS: Findings from the research indicate that organisations rarely review or change their performance management systems. The triggers for response also indicate triggers to review a BPMS to ensure alignment.

Alignment in supply chains: Having shareholder alignment does not mean that value is created, nor does having supply chain process alignment mean that value is created – rather they mean that values can be identified to meet value targets. Misalignment between shareholder alignment and supply chain process alignment is a value gap and shows that an organisation is in tension. The process of piecing all of this together either via processes such as strategy formulation, resourcing, execution and implementation is responsiveness.

11.1.2. Methodological Contributions

Manufacturing systems management is an area that is subject to social and technical dimensions. The social aspect is an often neglected research area. The author originally set out to investigate responsiveness from a positivistic perspective. As identified in the literature review a number of works were already in progress on that aspect of responsiveness. To add to this, the theoretical investigation of the enablers and inhibitors exposed the need for a behavioural model because even with the right processes in place, misaligned behaviours can lead to poor performance. This directed the research question towards 'how' rather than 'what' and case study/ action research was considered to be the best approach to this. However, this field of research is typically resistant to the academic legitimisation of action research and so the steps in **CHAPTER 3** were taken to ensure a consistent approach. Based on this experience a contribution to methodologies in manufacturing systems is that case study and action research are not mutually exclusive, both imply one another. Action research can be argued to be a form of case study – a prospective case study. Likewise certain case studies are action research because when observing in a real life context it is hard to separate extraneous variables from having an impact on the study. A researcher's involvement (pure observation) has an impact on a 'pure' case study research except that it is not acknowledged whereas for legitimising action research such biases are declared. The strength and richness of data gathered via action research in this study provided the ability to identify underlying mechanisms that go beyond sheer association. It provided an additional dimension that showed clearly what preceded what, either through direct observation, validation with the case companies or retrospection. Following this method required the researcher to move away from a natural choice of positivism to a realist stance. The success (based on outputs) of the research process is proof that whilst many philosophies exist and are debated, it is possible to adopt a philosophy that is not the natural choice of a researcher in order to best address a specific scientific enquiry. This in itself is a part of the learning process.

11.2. Further Work

Limits to the generalisability of this research suggest avenues for future research. Firstly the findings could be further validated by testing it in wider industrial contexts and across a large sample to increase its generalisability. Also the circumstances surrounding each case somewhat inhibited the ability to cover the ideal scope of the research. This leaves room to further test the model in the same manner in similar settings and even perhaps as a longitudinal study for multiple iterations of the model.

The enablers and inhibitors identified is another area that can be improved. The research output is a first attempt so there is scope to further the underlying mechanisms to their causality and further validating it.

Finally applying such a model requires supporting tools. Whilst some have been suggested, more could be developed or searched out in order to facilitate practice.

11.3. Moving on...

Organisations are evolving from traditional ways of doing business to an era where supply chains compete (Christopher, 1998). Thus calls for new business models that are better facilitated by being organised along processes associated with value segments (e.g. **Figure 10-8**) rather than fragmented functional groups. Organising along such lines means that the supply chain of a value segment can be easily assessed for the value it delivers to its shareholders. As investors constantly seek new ways to assess the risks and returns associated with their investments, future trends could move towards financial models for evaluating supply chains and hence floating supply chains on the stock exchange.

To enable this the researcher is interested in furthering the developments of this research by devising a way to calculate value gaps in financial and customer value terms.

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To John - **Hotel Academia**

On a dark campus pathway, cool wind in my hair
Greasy smells from Café Pacific, rising up through the air
Up ahead in distance, I saw a reason for plight
My head grew weary and my sight grew dim
I had to stop for insight
There he stood at the door way – asking if I could spell
And I was thinking to myself - this could be heaven or this could be hell
Then he flicked on a light bulb and he showed me the way
There were voices down the corridor; I thought I heard them say

Welcome to the hotel academia, such a lovely place
But they are short on space
Plenty to do at the hotel academia, any time of year
You got not time to spare

Now her mind's definitely twisted - I mean she's writing this verse!
She's got a lot of journal paper authors she calls her friends
Others dance at the union bar, I have to sit here and sweat
Got references to remember and reviews to forget!
So I called up my supervisor
"Please give me some travelling time"
He said "I haven't had your chapters yet, I want that paper by nine"
Still those voices are calling from far away,
Wake you up in the middle of the night
Just to hear them say...

Welcome to the hotel academia, such a lovely place
But they are short on space
No living it up at the hotel academia, rub your tired eyes
For you must revise

Books stacked to the ceiling,
Jack Daniels, no ice
And he said "we are all just prisoners here of our own device"
And at the Masters level year end, they gathered for the feast
They slash it with their steely red pens but they just couldn't shrink the thesis
Last thing I remember, I was running for the door
I had to find the passage back to the place where I was before
"Relax" said my supervisor "you'll get your PhD..."
You can submit any time you like,
But you can never leave!" ☺

A parody of Eagles' Hotel Carlifornia