Exploring deeper structures in manufacturing strategy formation processes: a qualitative inquiry

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EXPLORING DEEPER STRUCTURES IN MANUFACTURING STRATEGY FORMATION PROCESSES: A QUALITATIVE INQUIRY

by

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This thesis reports on an empirical investigation into manufacturing strategy (MS) formation in practice. The broad objective is to advance the understanding of MS processes through constructing consistent patterns in decision–making and action–taking relating to the manufacturing structure and infrastructure of the organisations studied.

Using the "Grounded Theory–Case Study" approach, nine organisations within the metal products, machinery and equipment manufacturing sectors in Australia were studied, in order to address the following research questions:

How are competitive priorities arrived at and translated into decisions and actions regarding the manufacturing structure and infrastructure?

What are the consistent patterns of manufacturing strategy formation within specific organisational contexts and why those patterns exist that way?

Qualitative data gathered through interviews conducted with the management staff – based on the sequences of events, actions and decisions, as well as other broader aspects of MS – were analysed by means of progressive coding. The themes, relationships and conceptual schemas emerged through the coding process are presented using narratives and graphical displays. The overall findings are presented in aggregate terms using a conceptual model, supplemented by several theoretical propositions.

Deeper structures in MS processes represent linear and parallel, converging and diverging and sequential and iterative progression of strategic initiatives across four major phases identified as initiation, progression, commitment and realisation. The multiple modes of initiation, alternative paths of consolidation and differing forms of commitment and realisation are explained by the nature of strategic initiatives, the causal links between the modes themselves and the influence of certain organisational contextual factors.

When enfolded in extant literature, these findings make two major contributions. First, apart from corroborating the complex and dynamic nature of MS formation in practice, they explicate the underlying patterns and alternative forms of MS formation. Second, they demonstrate some causal relationships between alternative forms of MS formation and certain contextual factors. These insights would inform future research, leading towards the development of a plausible mid–range theory of MS processes. They would also help practitioners to better understand the dynamics of MS formation and to nurture appropriate forms of MS formation within specific organisational settings.

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THIS SHEET IS TO BE GLUED TO THE INSIDE FRONT COVER OF THE THESIS

DEDICATION

to my beloved father

for guiding me with great wisdom

and

to my loving mother

for her enduring emotional support

ORIGINALITY STATEMENT

'I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the award of any other degree or diploma at UNSW or any other educational institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by others, with whom I have worked at UNSW or elsewhere, is explicitly acknowledged in the thesis. I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation and linguistic expression is acknowledged.'

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EXTENDED ABSTRACT

This thesis reports on an empirical investigation into manufacturing strategy (MS) formation in nine organisations. The broad objective is to advance the understanding of MS processes in practice through constructing consistent patterns in decision–making and action–taking relating to the manufacturing structure and infrastructure of the organisations studied. A deeper process understanding would be useful in nurturing appropriate forms of MS formation within specific organisational settings.

Using a combined "Grounded Theory–Case Study" approach, nine organisations within the metal products, machinery and equipment manufacturing sectors in Australia were studied, in order to address the following research questions:

> How are competitive priorities arrived at and translated into decisions and actions regarding the manufacturing structure and infrastructure?

> What are the consistent patterns of manufacturing strategy formation within specific organisational contexts and why those patterns exist that way?

The study heavily relied on qualitative data gathered through interviews conducted with the management staff representing different layers and/or functional areas of the nine case organisations. The predominantly text–based data relating to the sequences of events, actions and strategic decisions, as well as other broader aspects of MS were analysed by means of progressive coding – a technique used within the ground theory approach. The themes, relationships and conceptual schemas constructed through the coding process are presented using narratives and graphical displays. The overall findings are presented in the form of a conceptual model depicting deeper structures of MS formation and several theoretical propositions, supplemented by some general observations relating to the MS process and content.

The deeper structures of MS formation constructed in this study represent linear and parallel, converging and diverging and sequential and iterative progression of strategic initiatives across four phases identified as initiation, consolidation, commitment and realisation. The multiple modes of initiation, alternative paths of consolidation and differing forms of commitment and realisation are explained by the nature of strategic

initiatives, the causal relationships between the modes/phases themselves and the influence of certain internal and external organisational contextual factors.

The individual, cultural and political factors, along with the organisational structure influence the ways in which strategic initiatives progress across the four phases, whereas the two key external factors – competitive rivalry and market conditions – are strongly linked to the mode of initiation. The nature of strategic issues confronted in each initiative is also closely linked to the external contextual factors. Apart from these external factors, the three internal factors – size of the firm, stage of firm development and ownership – also directly influence MS formation.

As strategic initiatives are evoked by a number of stimuli, under the influence of multiple contextual factors, the co–existence of secondary forms of MS formation alongside a dominant form and the likely routes those different strategic initiatives follow are explained by the above findings. As such, the possibility of deliberate and emergent forms of MS/operations strategy (OS) formation within a single entity, as has been claimed in previous empirical studies, are supported by these findings.

The sample of case companies used in this study provides further empirical evidence to support the dynamic and complex nature of MS/OS formation and the alternative forms of MS/OS processes found in several previous studies that have used similar samples from other regions of the world.

The findings of this study also provide contradictory evidence in relation to some other findings of previous MS/OS studies. For example, the intermediary role of marketing strategy in the MS/OS process and the strictly hierarchical causal links between the elements of strategy development depicted in existing models are not supported by the findings of this study. The relationships between business strategy, MS and strategic manufacturing decisions and actions are far more complex than what could be described by simple hierarchical links associated with the organisational structure. The hierarchical order observed in this study is described as "top–down and middle–up–down", which can be better presented as layered networks of linear, interactive and iterative links that are shaped by the influence of a variety of contextual factors.

Apart from a formally recognised business strategy or agreed–upon strategic directions, a number of other factors can alter the mix of competitive priorities and/or their relative importance. Additionally, strategic manufacturing decisions and actions are not necessarily driven from competitive priorities, there are no clearly articulated frameworks for guiding strategic manufacturing decisions and actions, particularly at the lower levels of management, and the manufacturing's contribution to developing and/or agreeing on competitive priorities is limited.

A few recent studies have mapped the influence of certain organisational contextual factors on MS processes, leading to the development of some useful insights. This study further advances this knowledge by way of developing some tentative relationships between alternative forms of MS formation and certain contextual factors to an extent that they could be validated through statistical techniques.

Overall, when enfolded in extant literature, these findings make two major contributions towards advancing the current understanding of MS processes. First, apart from corroborating the findings of previous studies that have revealed the complex and dynamic nature of MS formation in practice, it explicates the key process parameters/attributes and the alternative forms of MS formation. Second, it explores the relationships between alternative modes of MS formation and certain contextual factors, and establishes some causal links. The deeper structures of MS formation constructed in this study will feed future research in the MS/OS area, leading to the development of a plausible mid–range theory of MS/OS processes. It will also help practicing managers to better understand and manage MS processes and to identify and nurture appropriate forms of MS formation within specific organisational settings.

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LIST OF PUBLICATIONS

Selected materials presented in this thesis have been included in the following publications.

Book Chapter:

Kiridena, S and Singh, P. (2008), "Strategic Approach to Operations Management", in Samson, D. and Singh, P. (Editors), *Operations Management: An Integrated Approach*, Cambridge University Press, Melbourne.

Refereed Journal Article:

Kiridena, S., Hasan, M. and Kerr, R. (2009), "Exploring Deeper Structures in Manufacturing Strategy Formation Processes: A Qualitative Inquiry", *International Journal of Operations & Production Management*, Vol. 29 No. 4, pp. 386–417.

Refereed Conference Papers:

Kiridena, S. and Fitzgerald, A. (2006), "Case Study Research in Operations Management", *The ACSPRI Social Science Methodology Conference,* Sydney Australia.

Kiridena, S. (2006), "Strategic Decision Making in Small Manufacturing Firms: The Process, Context and Outcomes", *The 4ᵗʰ ANZAM Operations Management Symposium*, Wellington, New Zealand.

Kiridena, S. (2005), "Beyond Constructs and Linkages: A Grounded Model of the Manufacturing Strategy Formation Process in Practice", *Proceedings of the 3ʳᵈ ANZAM Operations Management Symposium*, Rockhampton, Australia.

Kiridena, S. (2004), "Operations Management Theory Building Research: Case Study Approach and Some Methodological Issues", *Proceedings of the 2ⁿᵈ ANZAM Operations Management Symposium*, Melbourne, Australia.

Kiridena, S. and Hasan, M. (2003), "An Exploratory Study of the Manufacturing Strategy Process in Practice", *Proceedings of the 17ᵗʰ ANZAM Conference*, Fremantle, Australia.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: INTRODUCTION

1.1. Manufacturing Strategy in Context

This study examines manufacturing strategy (MS) processes in practice with a view to exploring their deeper structures or underlying patterns. It employs a qualitative research approach aimed at answering "how" and "why" as opposed to "how to" type questions associated with MS processes. The term "manufacturing strategy", within the context of this study, is used in tandem with its predecessor "manufacturing policy" and its more encompassing successor "operations strategy" that incorporates both manufacturing and service perspectives. As MS is one of the central topics within the operations management (OM) discipline, this chapter starts with a brief introduction to OM highlighting its strategic role and significance. In recognition of the current trends within the field, it also touches on some emerging alternative approaches to OM. As such, it is expected that this introduction will help understand and position the concept of MS in its broader context.

1.1.1. Strategic Significance of Operations

The operations function holds the ownership of the core transformation processes, and manages the vast majority of the value–adding activities taking place within an organisation. It also accounts for the bulk of an organisation's resources – be they people, facilities, technology, or knowledge and skills (Kiridena and Singh, 2008). It is through the diligent and skilful deployment of these resources and capabilities (as embedded in various organisational activities), guided and conditioned by strategy and organisational values, that an organisation creates and sustains a competitive advantage. However, historically, the role of operations in contributing to an organisation's competitive advantage had not been well–recognised at the corporate level. It was through the relentless efforts of Wickham Skinner, who pioneered the cause of manufacturing policy, that this issue was brought to light (Hayes, 2002). Skinner's intellectual enlightenment, along with the subsequent contributions of other pioneering researchers, has laid the foundation for an expansive body of knowledge that exists today in the form of operations

strategy (OS). Manufacturing can be a competitive weapon or a corporate millstone depending on the way firms perceive the relationship between manufacturing decisions and actions and corporate strategy (Skinner, 1966, 1969, 1971). This was the central theme of Skinner's early work that summed up the strategic significance of manufacturing. He, having noted the changing competitive milieu and the resultant conflicting demands placed on the manufacturing function, has argued for a shift in thinking about manufacturing's traditional subordinate role and a greater recognition of its strategic significance at the corporate level (Skinner, 1969, 1985). Skinner's scholarly work, elaborated and further refined by his colleagues Robert Hayes, Steven Wheelwright and Roger Schmenner (Hayes, 2002), has articulated the link between manufacturing decisions and actions and corporate strategy, as well as the nature and the significance of strategic decisions and actions within the domain of manufacturing. Some of the terms he coined and the concepts he introduced have later become the conceptual pillars of MS.

1.1.2. Operations' Contribution to Competitive Advantage

Organisations may enhance their performance, vis–à–vis competition, in a number of ways: improving productivity; using advanced technology; developing and applying new knowledge and capabilities; and through product and process innovation (Kiridena and Singh, 2008). However, most of the contemporary discussion on competitiveness revolves around the concept of "customer value creation". Extensive and sophisticated definitions and interpretations of the term are provided in marketing and strategy literature (Bowman and Ambrosini, 2000; Khalifa, 2004; Woodruff, 1997). However, in this chapter, the core concept will be used in a simplified form to serve the purpose of this study. Potential customers evaluate alternative products and services that are available in the market based on their "utility" a term borrowed from economics. Utility as a value determinant reflects the benefits derived from consuming or possessing a product or service, and could manifest in various attributes of the same. For instance, they may reflect functional value such as technical performance, aesthetic value such as physical features, or social value such as brand image. A wider perspective of value may also imply other intangible attributes of a product–service package such as friendly customer service, convenience,

availability, clean and attractive service settings and even social and environmentally–friendly aspects. However, to be able to use the term "utility" meaningfully as a measure of customer value, it should be expressed with reference to the price that a customer is willing to pay for a certain product/service at a particular time, under a given set of circumstances (Kiridena and Singh, 2008). This means that all of these value determinants may not be equally important to every customer every time, when making a purchase.

For some customers, it is the superior quality of the product and customer service that matter most when making a purchase (e.g. prestige cars, luxury accommodation), whereas for others it could be the quicker delivery of the product/service and convenience (e.g. express vs. normal post, fast food vs. gourmet meals). Yet another group of customers would be happy with a reasonable level of functional value offered by a product/service, but make their purchase primarily based on the price and availability (e.g. no–frills brands, budget accommodation). This doesn't necessarily mean that customers who make their purchasing decision based on one or two key value determinants are ignoring all other attributes. They still expect other attributes of a product/service to be satisfactory.

Hill (1989) coined the terms "order qualifiers" and "order winners" to illustrate this phenomenon. "Order qualifiers" are the product or service characteristics that help them to go onto a customer's short–list, whereas "order winners" are those characteristics that are perceived by potential customers as superior to competitors' offerings and hence convince them to buy the product or service. Qualifying characteristics are necessary but not sufficient for a product or service to gain entry into a market and stay there. Moreover, both order qualifiers and winners are market–specific and do change over time. Therefore, Hill (2005) argued that firms must identify order–winning and order–qualifying criteria for each market they target and/or serve and develop and sustain those product/service characteristics on an ongoing basis.

From an operations perspective, customer value is defined as a function of performance–related parameters of a product or service and the price at which they are delivered. The

relationship between those parameters can be expressed using the following formula (Melnyk and Denzler, 1996):

$$\text{Customer Value} = \frac{\text{Performance}}{\text{Price}} \text{; or in an expanded format,}$$

$$\text{Customer Value} = \frac{f\,[\text{Quality, Delivery, Flexibility, Service}]}{\text{Price}}.$$

As this relationship suggests, organisations can enhance customer value by way of improving product or service performance in terms of one or more of the key value determinants, reducing the cost of delivering a certain level of performance, or some combination of both. In Porter's (1996) terms " … it [the firm] must deliver greater value to customers or create comparable value at a lower cost, or do both; … delivering greater value allows a company to charge higher average unit prices, greater efficiency results in lower average unit costs" (p. 62). Porter's seminal work on competitive advantage (1985) has discussed in detail how the notion of "value chain" can be used to organise a firm's value adding activities so as to support a generic strategy. Porter's value chain framework has later been used by some OM scholars in their advocacy for a value network approach to managing operations across what they called "supply and demand chains" (Rainbird, 2004; Walters and Lancaster, 2000; Walters and Rainbird, 2007). For instance, Rainbird (2004) has noted that "value chain has its own frictions and interaction costs and the friction arises as the core demand and supply processes interact and fuse" (p. 243). He has further claimed that "while this interaction will generate costs … it also is a potential source of dynamism and competitive advantage" (p. 243). Walters (2002) has proposed that while Supply Chain Management (SCM) serves "the functions of facilitator and as a means of differentiating a product offer by adding generic or specific elements of service" value chain management, which he claimed to be a broader concept than SCM, "assumes the role of innovator, integrator and operations coordinator" (p. 103). These assertions depict, in conceptual terms, the essence of operations' contribution to competitiveness.

However, in practice, customer value is created through various activities undertaken as part of the transformation process, which is the core function of any operations system. Therefore, an organisation's ability to deliver customer value in the forms discussed above depends, to a large degree, on the capabilities and other characteristics of its operations system. Because an organisation's competitiveness, at the most fundamental level, is determined by this value creation process, it explains, in part, why "operations" is considered to be the major contributor to competitive advantage. OS, as will be further explored in this thesis, is broadly viewed as the patterns in a stream of decisions and actions that shape the operations system in supporting this "value creation" in order to enhance an organisation's competitive position. The terms "organisation", "firm" and "company" are used interchangeably in this thesis to represent the same organisational entity, with no differentiation on the basis of its legal, economic or ownership status.

1.1.3. Alternative Approaches to Managing Operations

Today, markets are becoming increasingly global, whereas customer requirements are getting ever more sophisticated and rapidly changing. Customers' knowledge of products and technologies and their awareness of social and environmental issues are constantly improving. Economic fluctuations, government regulations and societal pressure are the forces that firms must learn to live with. Organisations are increasingly relying on technology as a source of, as well as a vehicle for, achieving and sustaining competitive advantage. Mergers, acquisitions and alliances of varying forms are all too familiar scenes in the corporate world. The traditional organisational boundaries are becoming less meaningful when it comes to sustaining competitiveness. The new rules of competition are emerging based on such concepts as extended enterprise, virtual organisations and value networks. These developments can have significant implications for managing operations.

In essence, technological advancements, intense competition and fast changing customer preferences call for more sophisticated and holistic approaches to strategic management of operations. These developments also mean that there could well be more than one (best) approach to studying operations (Cox, 1999). Systems and process perspectives are two

popular approaches that have been used in studying OM. The former has traditionally viewed operations as an interdependent part of a complex system, and advocates integration and congruence across functions as well as the alignment/consistency between functional, business unit and corporate strategies (Russell and Taylor, 2006; Samson, 1991). The latter emphasises managing operations as business processes, which typically represent series of activities or workflows that extend across functions (Slack *et al*., 2006). However, these approaches have largely operated within the traditional boundaries of the firm. Some authors have argued that operations' contribution to competitive advantage cannot be fully realised without taking a total supply/value chain approach to managing operations that cuts across organisational boundaries (Harland *et al*., 1999; Walters, 2002). Another perspective that has ramifications for OM is the stakeholder approach (Freeman, 1984, 2004; Souza and Williams, 2000). With a view to positioning the concept of OS/MS in its broader context, these two perspectives are briefly discussed below.

There is growing recognition of the supply chain/value network approach to OM. Some of the developments referred to above call for viewing value creation in the context of a network of organisations rather than within the boundaries of individual firms. A supply chain/value network approach to operations advocates the alignment and integration of key business processes across the entire supply chain/value network with particular emphasis on efficiency, responsiveness and agility (Lowson, 2003a; Sadler and Hines, 2002; Walters, 2002). These parameters can be broadly viewed as expansions of the value determinants discussed earlier to suit the concept of an extended enterprise. Harland and colleagues (1999) have proposed that "supply strategy can build on and externalise the rational OS approaches, to extend them to inter–organisation networks" (p. 663). Power (2005) has emphasised the integration of core business processes across organisational boundaries through improved communication, partnerships, alliances and cooperation.

However, a truly distinctive and comprehensive supply chain approach would be more sophisticated and challenging than the interfacing of business processes/structures and the management of materials and information flows across organisational boundaries. Because supply chains consist of a number of firms that are based on varying business

models with differing capabilities, resources and organisational cultures, other "soft" aspects such as relationships, trust and transparency also become critical aspects of value creation at the supply chain–level (Roh *et al.*, 2008; Shub and Stonebraker, 2009). This means organisations should appreciate the role of business ethics, organisational values and social responsibilities as essential ingredients for success within the context of supply chains. Nonetheless, these noble precepts have to be observed against a host of evil forces and commercial realities that are inherent to the traditional entity of the firm: a desire to maximise returns at the individual organisation–level; frenetic moves towards business consolidation; incompatible goals, capabilities and infrastructure of individual firms; and the need to protect commercially sensitive information and/or proprietary knowledge.

Additionally, there are an ever–increasing number of stakeholders in and around the firm. Stakeholders, defined as "any group or individual that can affect or is affected by the achievement of a corporation's purpose" (Freeman, 1984: 46) may include owners or shareholders, the management, employees, customers, suppliers, the government(s) and the wider community. Stakeholder theory, in general, recognises the role and expectations of the owners and/or shareholders of the firm, the responsibilities and interests of the top management team, contributions and expectations of employees, the importance of market intelligence, customer involvement and the relationships with suppliers (Payne *et al*., 2005; Souza and Williams, 2000). The stakeholder approach also calls for a heightened awareness of the expectations of the society and an active and ongoing engagement with governments, policy–makers and other interest groups. This thinking extends the current understanding of the sources of competitive advantage because the notion of stakeholder approach rests on a different premise: the role and contribution of the distinctive structures of relationships among key stakeholders in creating value for the betterment of all stakeholders (Kay, 1993).

Stakeholder considerations cut across the whole spectrum of OM activities: system design and technology choice, people and process management, performance measurement and management, and so on. Environment–friendly approaches to technology development and product/service design and delivery, socially–responsible business practices, family–

friendly work environments and holistic approaches to performance measurement (for example, triple–bottom–line measures) – they all have implications for OM. A stakeholder approach to operations would also allow for accommodating the interests of internal stakeholders, such as the top management and other functions like marketing within the same organisation. For example, Hill and colleagues (Hill, 1989, 2005; Berry *et al*., 1995, 1999) have long been advocating the need for marketing and operations to engage in a comprehensive debate towards agreeing on what markets to serve. Similar sentiments have been echoed by other authors who have emphasised the need for participation and dialogue in addressing strategic operations issues and taking a stakeholder approach to managing operations (Souza and Williams, 2000; Walters, 2002). These developments will essentially further complicate strategic decision-making, create new challenges for operations managers and place extra demands on all those who are involved in managing operations. Furthermore, these emerging alternative perspectives present significant opportunities for OM/OS researchers to generate new knowledge.

1.2. The Significance of this Research Study

Manufacturing has been the backbone of western economies for decades. However, the changing dynamics of global manufacturing mean the traditional manufacturing bases in developed countries are shrinking fast (Poloz, 2006, Vardaman, 2002). This doest not necessarily imply that developed nations have renounced their dominance over manufacturing altogether. They are exploring new forms of competitive advantage through numerous means: investing in knowledge–intensive sectors; leveraging on their capabilities in design and engineering and/or advanced manufacturing; and focusing on innovation as a key driver of competitiveness (Schott, 2007). Firms in developed countries are setting up offshore plants and entering into joint ventures with their counterparts in developing countries with a view to achieving cost advantages and enhancing prospects of access to emerging host–country markets. There have also been recent moves by large firms in developing countries to locate manufacturing plants and/or acquire firms in developed countries.

The latest available data published by the Australian Bureau of Statistics (ABS) suggest that notwithstanding the many challenges faced by the Australian manufacturing sector its significance remains high. Despite registering the largest fall in industry shares of Gross Domestic Product (GDP) in the ten–year period from 1995–96 to 2005–06 (down 3.3 per cent) manufacturing, with its share of 10.4 per cent, still remains the second highest contributor to GDP in Australia, after the property and business services sector which now has a share of 11.8 per cent (ABS, 2009a). By comparison, China's manufacturing sector has accounted for 24 per cent of its GDP in 2007, which was 37 per cent two decades ago (Republic of China: Year Book, 2008) and the contribution of India's manufacturing sector to its GDP in 2006 was 17 per cent (Department of Commerce: India, 2006). As of February 2009, the Australian manufacturing sector employed over 10 million people, which is 9.3 per cent of total employment (ABS, 2009b).

In 2006–07, the Australian manufacturing sector has shown growth against seven out of eight head line measures. Compared to 2005–06 figures, sales and service income has risen 12 per cent, industry value added has increased 9 per cent and wages and salaries has risen 7 per cent (ABS, 2008a). Employment, the only measure to have shown negative growth, has declined 0.2 per cent on the 2005–06 level. As reported in the Australian System of National Accounts 2007–08, the manufacturing sector has recorded a moderate overall growth of 3.4 per cent with the metal products manufacturing sub–sector registering the highest growth of 11.4 per cent on the 2006–07 level (ABS, 2008b).

Against the backdrop of increasing globalisation and intense competition from low–cost manufacturing bases in emerging economies, successive governments in Australia have endeavoured to strengthen the manufacturing sector thorough numerous policy measures. These policy measures have focused on transitional assistance to key industry sectors through periods of trade liberalisation and industry rationalisation, encouraging innovation, supporting investment in research and development and a range of other programs aimed at enhancing productivity and the global competitiveness of the industry (Department of Innovation, Industry, Science and Research, 2009).

The industry is re–positioning itself in response to these changing circumstances through strategic manoeuvres. Some analysts suggest that the challenge of low–cost manufacturing from developing countries have met by firms in developed countries with differentiated products (Schott, 2007). This proposition is supported by the co–existence of markets, in developed countries, for discounted, commoditised, less–sophisticated imported products and high–margin, sophisticated, high–quality locally–manufactured products. There have also been efforts by firms in developed countries to focus on advanced manufacturing and design and engineering activities over general manufacturing and assembly operations.

Most of these moves are underpinned by the strategic "decision–making" and "action–taking" at the firm–level, which is the subject of this study. The strategic significance of manufacturing at the macro–level outlined above has been matched by the interest shown by the scholarly community in studying MS/OS at the firm–level, as reflected in the research undertaken over a period of four decades.

Substantial scholarly work has been carried out covering numerous aspects of the concept of MS since its presumptive conception in the 1950s. The concept has become popular within the academic community, and is gradually gaining momentum in the industry as well. Despite these positive developments, a number of studies have revealed that many organisations have not been able to realise the full potential of operations in achieving and sustaining competitive advantage (Kim and Arnold, 1996; Skinner, 1992; Thethi and Wainwright, 1995). Skinner's (1992) comment that "the recent success we academics find so exciting is actually hollow in certain respects and more self–comforting than real" is quite disturbing. Citing the results of well–known International Manufacturing Futures Survey, Kim and Arnold (1996) have claimed that although the MS concept was appealing to many organisations, its realisation on the factory floor remained problematic. In another study conducted over a five–year period covering a range of firms in fifteen countries (Americas, Europe and Asia), 82 per cent of the managers surveyed have believed that the plethora of new management tools and techniques "promise more than they deliver" (Rigby, 2001: p. 144). It has further observed that, notwithstanding the high costs associated with their adoption, companies continue to use them. Hays and Pisano (1994)

have observed that despite the popularity of these newer approaches to manufacturing, the gap between so–called *best–performing* firms and the *rest* is getting increasingly wider.

In general, there is widespread understanding and consensus among scholars, as well as practitioners, regarding the importance of manufacturing's contribution to competitive success and the proactive role that has to be played by the manufacturing function as opposed to its traditional subordinate and reactive stance (Hill, 1989; Sweeny, 1991; Sweeny and Szwejczewski, 1996). However, translating the existing knowledge of MS into practice has been problematic (Kim and Arnold, 1996; Rytter *et al.*, 2007).

There are numerous issues relating to research, practice and people involved, as well as those identified as historical or evolutionary reasons that have led to this situation (Anderson *et al.*, 1991; Dangayach and Deshmukh, 2001a; Hill *et al.*, 1999; Leong *et al.*, 1990; Smith and Robey, 1973; Schroeder *et al.*, 1986). OS research has been dominated by normative approaches and prescriptive models/frameworks due, in part, to its inheritance of the technique–based discipline of OM (Hill *et al.*, 1999; Meredith, 1993; Smith and Robey, 1973; Westbrook, 1995). There has also been a "dearth of cohesive theory–building efforts", particularly to substantiate those prescriptive frameworks, which has been exacerbated by a lack of empirical research in the area (Kim and Arnold, 1996: p. 55). Moreover, OS research appears to have not drawn from the more mature area of business strategy. For example, strategy process research has endeavoured to advance the understanding of the dynamics of strategy formation across multiple levels of abstraction while considering the varying and changing contexts, and has addressed issues from multiple perspectives employing a wide range of methodological approaches (Hutzschenreuter and Kleindienst, 2006). This level of richness and diversity is not evident in OS research. Skinner (1992) has affirmed that four links were still missing in MS research and practice while uncovering four major obstacles to the adoption and diffusion of the MS concept in the industry namely, flaws in leadership, problems in middle management, problems of the functionally arranged organisational structures and a lack of conceptually sound ideas. Among others who have emphasised similar issues are Adam and Swamidass (1989), Hill (1992), Hayes and Pisano (1994) and Thethi and

Wainwright (1995). Interestingly, much of the criticism is still directed at the lack of conceptual understanding and attitudinal changes among practitioners which happened to be the theme of the initial discussions that were taking place some thirty to forty years ago (Akkermans and Van Aken, 1992).

In the foregoing context, one of the major challenges faced by MS researchers and practitioners alike, today, is finding the best means to deal with the chronic lack of penetration and progress, or what Skinner (1992) called the "biological rejection", of the MS concept within the industry. Therefore, it is imperative that the OS research community makes a concerted effort and takes a systematic approach in addressing this issue. This research study is a step in that direction.

1.3. The MS Problem and the Research Questions

The literature abounds with multi–fold causes surrounding this "lack of progress and penetration" and other related problems. Some emanate from within the MS/OS research area itself, while others are attributed to problems associated with the industry, or the practice of OS. A lack of emphasis on a sound framework to guide managers in decision making, inconsistencies between different approaches developed so far, a lack of interrelationships and poor coordination among various arms of research and limited cross–referencing and use of similar work carried out in related disciplines were among the most commonly cited shortcomings in the area of MS research (Anderson *et al*., 1991; Adam and Swamidass, 1989; Leong *et al*., 1990; Rusjan, 2005). In contrast, most of the issues attributed to the practice of OS are related to the way operations systems have evolved over time that have led to systems with structures, practices, leadership and other attributes deemed detrimental to the progress of the concept (Hill, 1992; Skinner, 1992; Thethi and Wainwright, 1995; Wheelwright, 1984). The overall situation has also been often attributed to a gap between the OS research and practice.

Kim and Arnold (1996) have interpreted this gap as a "lack of collective understanding in how competitive priorities are operationalised" (p. 46)**.** This observation could be

extended to cover many other prescriptive and normative frameworks available within the MS domain as well. The operationalisation problem has been dealt with by a number of scholars from varying perspectives: clarifying and refining existing concepts and presenting them in ways that are more appealing to practitioners; disaggregating more abstract constructs into lower–level elements; and devising analytical tools and techniques (Hum and Leow, 1996; Kim and Arnold, 1996; Tan and Platts, 2004). However, if the developments in the business strategy area are any guide, there lies a more fundamental issue with the problem of operationalising OS. What can be learnt from synthesising the existing literature in both MS/OS and business strategy areas is that there is a lack of collective understanding of the underlying dynamics of OS formation in practice. Compared to the detailed level of process understanding that has been achieved in strategy research, through studies undertaken at different levels of analytical abstraction and using a range of methodologies, process understanding within the OS domain is, at best, very limited. The majority of OS process research is still dominated by deductive approaches that are based on observations made some thirty years ago. For example, except for a few recent empirical studies that have explored the OS process in practice using qualitative approaches, the majority of past research has replicated the traditional top–down rational planning approach to strategy, in highly abstract forms (Cheng and Musaphir, 1996; Dangayach and Deshmukh, 2001b; Darlow and Baines, 2000; Marucheck *et al*., 1990).

After acknowledging that the major challenge for OS researchers is dealing with the lack of penetration and progress of the OS concept in the industry, this study established two facets of the research problem as follows:

− lack of collective understanding and agreement on how to operationalise the existing concepts of OS; and

− lack of comprehensive understanding of the dynamics of OS formation in practice.

As referred to earlier, there have been a number of attempts to address the problem from the former perspective – operationalising existing concepts. But there have only been limited efforts in dealing with the latter aspect – studying OS process in practice. This

study recognises both perspectives. As such, two research questions that aim at addressing the problem are presented below.

− How are manufacturing priorities arrived at and translated into decisions and actions regarding the manufacturing structure and infrastructure?

− What are the consistent patterns of MS formation within specific organisational contexts and why those patterns exist that way?

The overarching objective of this study is, therefore, to explore and explicate the deeper structures of MS formation in practice. The focus of the above research questions on MS, instead of OS, is a reflection of the sample of case companies, which are predominantly manufacturing–based, selected for the study.

1.4. The Scope and Objectives of the Study

As set out in the previous section, the primary objective of this study is to advance the understanding of MS processes through exploring the deeper structures of MS formation in practice. To this end, it aims at studying organisational decision–making and action–taking relating to the operations structure and infrastructure of an organisation in their broader context and at a lower level of abstraction than has been used in previous MS/OS research. In doing so, it also attempts to develop some causal understanding, particularly any influence of organisational contextual factors on MS processes.

Given that the subject of this study is MS/OS processes, the unit of analysis is taken as organisational processes relating to strategic operations decisions and actions rather than individual cognitive/behavioural processes that have been widely used within the domain of strategic decision–making (Cyert *et al*., 1956; Hickson *et al*., 1986; Schwenk, 1995; Ungson *et al*., 1981). Studying strategic decisions and actions as organisational processes requires accounting for their key constituents and dynamics: for example, organisational actors involved, including their attributes, roles and contributions; administrative procedures; and other more abstract aspects like communication, information flows and

temporal dimensions. Studying MS processes in their broader context means exploring the effects of a range of internal and external organisational contextual factors such as the size and the maturity of an organisation, organisational structure and culture, managerial and/or leadership style, competitive rivalry and market conditions.

The decisions and actions relating to operations systems represent, in part, the content of OS, which fall under the typical structural and infrastructural areas of process positioning, facilities location, system capacity and design, technology and process selection, operations planning and control, quality management, organisation structure and culture and workforce management. As such, other more encompassing strategic decisions that are usually pursued at the business unit and corporate levels are not examined in this study unless they have a direct impact on the operations system. Additionally, despite an increasing relevance of SCM concepts in the current global business environment, this study chose not to exclusively focus on the SCM perspective. This choice was largely informed by the literature review, as summarised below.

In response to the developments cited earlier in Section 1.1.3, the OM discipline has been incorporating wider perspectives that extend well beyond the traditional boundaries of the individual firm (Krajewski *et al*., 2007; Samson and Singh, 2008; Slack *et al*., 2006; Walters and Rainbird, 2007). Scholars of OS have also been responding to these recent trends by investigating strategic issues that cut across organisational boundaries (Baines *et al*., 2006; Lockamy III, 2004; Lowson, 2002; Walters, 2002).

However, SCM as a discipline is still emerging with much of the scholarly effort focused on aspects such as defining the scope of the field, developing conceptual frameworks and building a coherent theoretical foundation (Cigolini *et al*., 2004; Cousins *at al*., 2006; Harland *et al*., 2006; Ho *et al*., 2002; Mouritsen *et al*., 2003). For example, the scholarly contributions has polarised on conceptualisations of SCM at two distinct levels of abstraction – a functional specialisation versus a more encompassing network perspective (Lockamy III, 2004; Mills *et al*., 2004; Giannakis and Croom, 2004; Skjott-Larsen, 1999). The concept of supply chain strategy (SCS) also remains not clearly articulated (Defee and

Stank, 2005; Harland *et al*., 1999). The multiple definitions and conceptualisations as well as the studies of SCS reflect the disparity between the functional and paradigmatic views of the SCM concept (Lockamy III, 2004). Moreover, several empirical studies have found that the concept of SCM is far from being well–conceived by practitioners (Fawcett and Magnan, 2002; Storey *et al*., 2006; Skjott-Larsen, 1999). The above observations suggest that a deeper level understanding of the dynamics of MS formation could inform future research on SCS, rather than vice–versa.

Moreover, SCM is one of several alternative perspectives from which OM can be studied. Other equally applicable and current perspectives include the systems approach, process approach and stakeholder approach. While the systems and process approaches are relatively established, the SCM and stakeholder approaches are still evolving. As such, choosing one perspective over the others to inform a study of OS may not be substantiated beyond some circumstantial reasons.

Informed by the literature review, this study decided in favour of leaving out these emerging perspectives to be dealt with in future research. The theoretical foundation, the research design and the conceptual framework developed in this study allow later incorporation of multiple perspectives, as required. For example, the concept of value creation could be expanded to accommodate the notion of value in the context of a network of organisations or a range of stakeholders. The unit of analysis – organisational processes relating to strategic decisions and actions – used in this study, as well as the range of strategic decisions and actions it accounts for are equally appropriate for the investigation of MS processes from multiple perspectives. For instance, typical SCM decisions such as channel positioning, global sourcing, offshore facility location and chain–wide forecasting and planning can all be interpreted in terms of the operations structure and infrastructure – be it in the context of an individual firm or a network of firms, whereas the key SCM objectives of efficiency, flexibility and agility can be interpreted within the framework of competitive priorities with a broader focus on the whole supply chain or a network of organisations (Baines *et al*., 2005; Lowson, 2003a).

1.5. Research Design and Methodology

The theoretical foundation required for this study is established based on a comprehensive review of literature covering the areas of MS/OS, OM and strategic management. The two research questions and the research design in this study are quite different to those of the previous empirical studies of OS in that they aim at studying OS formation processes at a lower level of analytical abstraction. For example, the study by Marucheck *et al*. (1990) had its objective as:

> to provide an exploratory examination of the process of formulating and implementing manufacturing strategy within the framework of overall corporate strategy as represented by practice in six leading–edge firms (p. 102).

This statement implies that MS is first formulated and then implemented within the broader framework of corporate strategy. Although the study has been termed as exploratory, such a bias would allow little room for other, perhaps more subtle, forms of MS formation to emerge through the study. The findings as well as the research design of the above study also indicate that MS process has been captured/studied at a highly abstract level with some a–priori bias towards the top–down planning model.

By comparison, Barnes (2002) has used two broad questions, presented below, that were open to both deliberate and emergent forms of MS formation:

> How does a company's manufacturing strategy form in practice?
> Why does the manufacturing strategy form in this way? (p. 12)

The findings were illuminating in that they were presented in the form of a descriptive process model highlighting the interpretative process used by managers as opposed to the top–down rational planning approach. The findings complement those of Swamidass and colleagues (2001) who have established, using a case study–based process mapping approach, three alternative approaches to the formal top–down planning process. This study builds on those findings and aims at further advancing the process understanding developed through previous studies.

Since the early calls for more empirical work (Anderson *et al.*, 1989: Schroeder *et al.*, 1986) there has been a considerable increase in the number of empirical studies on MS process (Minor III *et al.*, 1994; Swink and Way, 1995). However, the majority of those studies have mainly used questionnaire/interview survey techniques or the traditional case study approach (Flynn *et al.*, 1990). As a result, the majority of those studies have been criticised for their superficiality and/or lack of methodological rigour (Barnes, 2001; Hill *et al.*, 1999; Rytter, 2005; Stuart *et al.*, 2002). This study, in contrast, employs a novel qualitative approach, grounded theory–case studies, aimed at exploring deeper structures or underlying patterns of MS formation in practice with some causal understanding.

The approach used in this study differs from those of previous studies in that it combines the richness of case study narratives with the methodological rigour of grounded theory methods thereby improving the overall credibility of the research effort. Furthermore, with multiple–case studies, it aims at extending the generalisability of the findings beyond each case to cover a substantive area without compromising their internal validity. In addition, this approach is preferred to the more common questionnaire survey approach, which some authors call "arms–length" research, because it allows complete and in–depth treatment of phenomena through extensive on-site inquiries (Hill *et al.*, 1999).

The research design has included deciding on the unit of analysis, drawing a sampling plan and methods of data collection and analysis, as well as developing a case study protocol. The unit of analysis, as introduced in the previous section, has been decided as organisational processes of strategic decision–making and action–taking. Nine case organisations have been selected based on the purposive and theoretical sampling informed by the conceptual framework developed based on the literature review.

The approach summarised in Figure 3.1 (Chapter 3) was used in the collection, analysis and interpretation of mainly text–based data. Starting with the research questions, a comprehensive research protocol consisting of research instruments, an interview guide and sample interview questions was prepared in order to facilitate the data collection and analysis. The primary source of data was semi–structured interviews drawing participants

from different layers (from the senior management to supervisory level) and functional areas of the case–organisations studied. This was supplemented by direct observation of manufacturing processes and a limited archive/document analysis. Interviews were conducted with senior management staff representing manufacturing, marketing, human resources, as well as production, engineering, inventory and procurement areas, as applicable to each organisation. Up to three rounds of interviews were conducted in an iterative fashion usually over a period of two to four months. All interviews, where allowed, were recorded and transcribed into text for subsequent coding and analysis.

1.6. Data Collection and Analysis

As acknowledged above, the data used in this study were sourced from interviews, direct observations of manufacturing processes and a variety of internal and published company documents/archives. However, the vast majority of data was qualitative text gathered through the semi–structured interviews, which were guided by a series of prepared and impromptu questions. As such, the aim of data analysis was first to disaggregate and re–organise raw data so as to identify chunks of text representative of the parameters of interest, and then to re–aggregate and re–package them in order to construct descriptive and explanatory frameworks (Miles and Huberman, 1994). A start–list of provisional codes, mainly at a descriptive level, was identified based on the conceptual framework and later modified, refined and extended to include emerging new categories during and after data collection. In the data analysis, initial descriptive codes were mainly used to organise and retrieve data categories, while inferential codes and other data displays were used in identifying more abstract patterns or themes and in the interpretation of data.

This iterative process of data collection and analysis involved progressive coding of interview transcripts (as advocated in the grounded theory approach) towards identifying categories, themes and trends/patterns within each case as well as more abstract across–case conceptual schemas. The comparison of these within–case patterns/trends and conceptual schemas led to the development of a conceptual framework representing the deeper structures of MS formation in aggregate terms. The key patterns were then

discussed within the context of extant literature so as to make meaning of them by way of comparing, contextualising and explaining the emerging theoretical propositions. The main types of data displays used were matrices, causal networks and process maps (Darlow and Baines, 2000; Miles and Huberman, 1994).

The above process was facilitated by the use of "NVivo" qualitative data analysis software. From among several computer–aided qualitative data analysis (CAQDAS) software packages available, NVivo was chosen mainly for its features that facilitate the research process through progressive coding. The coding process closely resembled the grounded theory approach, compared to other similar text analytics used in ethnographic studies. The other reason for using NVivo as the preferred software was the availability of resource persons and technical support through a network of experienced colleagues.

Although using NVivo did not eliminate the manual work involved in interpreting text–based data it enhanced the efficiency of handling the large amount of qualitative data without losing its richness (through instance access to source data). It also introduced the much needed discipline in managing the project (i.e. record keeping and managing case and participant–based data files) which added to the reliability of the research effort.

1.7. Limitations of the Study

Despite the significance of its findings, this study has presented some difficulties and limitations relating to the methodology used and the generalisability of its findings.

Considering the limitations of some previous MS process studies, this study endeavoured to explore the nature of MS processes "as holistically as possible", while maintaining the appropriate depth of analysis and a high level of methodological rigour. This required crossing the traditional analytical boundaries. Compared to more tightly defined theory validation and theory extension research, exploratory studies aimed at theory–building research present several additional challenges. Reflecting on these challenges helps identify the limitations of the findings and may contribute to future research.

When using qualitative data, there is potential for the inaccuracy of retrospective accounts due to deliberate distortion or genuine loss of memory. Although the impact of these errors was mitigated using multiple sources and iterative data collection and analysis, they can hardly be eliminated. Similarly, when presenting the findings in such forms as case narratives and explanatory accounts, there is also a possibility of multiple interpretations. Despite specific measures such as the use of as many display tools as possible and providing detailed accounts of the research procedures followed and the methods of data analysis used, alternative interpretations still remain a possibility.

Notwithstanding their superiority over the quantitative methods in developing rich insights into emerging socio–technical phenomena, using qualitative methods in areas dominated by positivist traditions may encounter other problems that are less prevalent in the social sciences (Kiridena and Fitzgerald). For example, when attempting to present to an audience with positivist allegiances, researchers tend to adopt methods and writing styles that are representative of positivist traditions. In methodology literature this is known as using qualitative approaches, but succumbing to positivist tradition, and is said to be also influenced by the researcher's background. Despite its best efforts, this study was not completely immune to such generic flaws.

This study acknowledged, upfront, that its findings would not be generalised to populations. However, that does not necessarily mean that the applicability of findings is confined to the particular case companies studied. A sample size of nine cases in qualitative studies is considered to be substantial and particularly useful in drawing conclusions that can be generalised to theoretical propositions. In addition, when the results are enfolded in extant literature this further improves their generalisability. As such, the findings can be extrapolated to other populations with similar characteristics or to populations with different characteristics if the differences can be explained with the help of extant literature. However, in order to apply sample–to–population type generalisation they should be tested using larger samples and statistical techniques.

1.8. Thesis Outline

This thesis consists of seven principle chapters: Introduction; Literature Review; Research Design and Methodology; Within–case Data Analysis and Findings; Across–case Data Analysis and Findings; Discussion; and Conclusions, Implications and Limitations. These chapters are supplemented by References and Bibliography and Appendix.

Chapter 1 introduces the thesis with a brief overview of the strategic role of the operations function, its contribution to competitive advantage of a firm and a brief discussion of some alternatives approaches to managing operations, followed by a note on the significance of the research study. It then presents the research problem and research questions, sets out the scope and objectives of the study and provides a summary of the research design and methodology, including a brief description of the approach to data collection and analysis. The chapter concludes with this thesis outline.

Chapter 2 of this thesis is devoted to the literature review. It appreciates the value of studying MS in its broader context and, therefore, treats the relevant aspects of business strategy literature in some detail, before moving on to reviewing MS literature. The key elements of past MS studies are then reviewed and summarised followed by a close examination of the extant literature on MS process with particular attention to empirically derived MS process models and frameworks. Alternative manifestations of MS content as reflected in content research are also summarised as a precursor to synthesising existing MS process knowledge with a view to developing a conceptual framework.

Chapter 3 reports, in some detail, on the research design and methodology employed. It is organised in two main parts: one dealing with the research frameworks, the process underlying the choice of methodological approach and justifying the chosen methodology; and the other articulating the research journey with detailed accounts of the research design and procedures followed, the approach to data collection and analysis and the presentation of findings.

Chapter 4 deals with the analysis of within–case data and presents the findings in the form of case narratives. It also partially reveals the process behind the identification of patterns within each case and the progressive coding of write–ups employed in building data displays. These mainly descriptive accounts are supported by two types of data displays – matrices and process maps. Within–case patterns of strategy formation, with an emphasis on manufacturing perspectives, are presented in aggregate forms using causal networks at the end of each case narrative.

Chapter 5 develops across–case patterns of MS formation, including the ways in which competitive priorities are arrived at and translated to strategic manufacturing decisions and actions. This is undertaken through the comparison of within–case patterns constructed in the previous chapter and the identification of more abstract across–case patterns in the form of themes and conceptual schemas. It sums up the overall findings of the grounded theory case studies in the form of a conceptual model and several theoretical propositions.

Chapter 6 enfolds the findings in extant literature in an attempt to make meaning of the findings by way of comparing, contrasting and contextualising them against relevant and current literature. The pertinent aspects of relevant literature are elaborated and referred to in the discussion as required. In doing so, this chapter also aims at further advancing the causal understanding developed in the previous chapter.

Chapter 7 summarises the research effort, presents the conclusions drawn from the discussion of the findings and provides implications of the findings for theory, practice and future research. It also acknowledges the contributions of this study to theory and practice of MS and the limitations of the applicability of the findings.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

The literature review has formed an important part of this study. In a more conventional sense, it helped identify the research problems and develop the research questions. More importantly, it has made a major contribution to this thesis by way of shaping the emerging theory. For instance, the conceptual framework developed through the literature review served as the first step in theorising. It identified the elements of strategy process within its broader context and initial parameters of interest, as well as some tentative relationships among those elements and parameters. Along with the methodology literature reviewed, it also helped develop the research protocol by providing guidance in identifying and selecting appropriate sources of data, participants and case companies. Within qualitative frameworks, these tasks are treated as data reduction and, therefore, form part of the early stages of data analysis. Furthermore, the review of extant literature played an equally important role in the final stages of the study by helping to contextualise, and thereby to make meaning of, the research findings.

This study posits that studies of manufacturing strategy (MS) should be informed by the advances in the field of general strategy. As such, the literature review covers three major streams of scholarly work: the key concepts of strategy, including a brief account of their evolution; strategy process research; and MS research with an emphasis on process aspects. However, the chapter is organised with varying breadth and depth of coverage on each of those areas, in order to maintain its focus on MS processes. In addition, the summary of an extensive review of methodology literature is provided in Chapter 3.

This literature review culminates in a crude conceptual framework depicting the current status of knowledge on the MS process. The level of analytical abstraction and the limited details of process aspects reflected in this conceptual framework highlight the need for exploring the deeper structures of MS formation in practice.

2.2. Evolution of the Strategy Concept: Wars, Games and Firms

The roots of "strategic thought" can be traced far back into history, to when people used a variety of approaches to succeed on military fronts, in politics and lately in sports, or simply for such causes as their own survival and progress. The dictionary meaning of the word "strategy", derived from the nineteenth–century Greek word *strategia* (generalship) with its origins extending further back to the late fifteenth–century Greek words *stratos* (army) and *agein* (to lead), further confirms its links to military practice (Soanes and Stevenson, 2003: p. 1747). Citing such classical work as Sun Tzu's *The Art of War* and Machiavelli's *The Prince*, other authors have traced the origins of the strategy concept much farther back to the B.C. era (Bracker, 1980: p. 219; Mintzberg, 1990: p. 171).

The concept, as applied to firms, has been rejuvenated by the contributions of a number of early business management scholars of the twentieth century namely, Igor Ansoff (1965), Alfred Chandler (1962), Peter Drucker (1954), William Newman (1951), Edith Penrose (1959), Phillip Selznick (1957) and Alfred Sloan (1963). Since then, the concept has grown into a rich and robust intellectual domain while drawing from a number of other more mature disciplines such as sociology, psychology and economics. The progress has been evident on a number of fronts: advancing the conceptual and empirical understanding of the concept and practice of strategy; nurturing the alternative schools of thought or multiple perspectives of strategy; and using innovative and diverse methodological approaches in strategy research. Some scholars have appraised this as healthy eclecticism (Mintzberg and Lampel, 1999; Prahalad and Hamel, 1994), whereas others have asserted that strategy, as a field of study, has blossomed to an extent that the diversity and fragmentations have now become an impediment to its own progress (McKiernan and Carter, 2004). In the light of these observations, some authors have emphasised the need to re–examine the concept of strategy and re–evaluate the field towards synthesising existing knowledge (Hax, 1990; Mintzberg and Lampel, 1999; Prahalad and Hamel, 1994; Volberda and Elfring, 2001). These multiple perspectives are briefly reviewed in the following section, primarily, with a view to arriving at a working definition of strategy.

2.3. Multiple Perspectives on Strategy

The multiple perspectives of strategy referred to above have presumably stemmed from the way the concept has been perceived and/or treated, particularly by the scholarly community, with reference to the following aspects:

– the world views or epistemological assumptions holding the conceptual foundations of strategy and the unit of analysis used in research;

– the alternative processes through which strategies are formed, including the ways in which they are communicated among stakeholders;

– the roles and significance of people (decision–makers/organisational actors) involved in strategy formation;

– the outcomes of strategy processes and related aspects, including strategic positions, strategy archetypes, competencies and the organisational performance; and

– the interaction between strategy and the organisational settings (social system) in which they are formed.

The studies representing the alternative perspectives have traditionally been facilitated by different methodological paradigms, thus nurturing some philosophical debates over their validity and relevance. For example, Mintzberg (1994) argued for the value of "strategic thinking" (synthesis: applying judgement, intuition and creativity) over "strategic planning" (analyses: rearrangement of established categories) in an effort to explain why formal planning approaches to strategy have failed to deliver on their promises (pp. 107–109). Prahalad and Hamel (1994), in their call for re–examining the traditional strategy paradigms, commented that Mintzberg has not only "questioned the validity and the usefulness of the various approaches to strategy which has been the bread and butter of strategy research and thinking for the past twenty–five years", but has also "challenged the concept of purposeful organisation" (p. 6). Mintzberg's (1990) critique of the design school of strategic management has attracted similar commentary from Ansoff (1991), along the lines of the dichotomy that exists between the prescriptive and descriptive

approaches to strategy. The field of strategy, today, is the home for a growing number of complementary, overlapping and in some ways competing schools of thought, as summarised below.

2.3.1. The Classical School of Thought (pre-1980s)

The early conceptualisations of business strategy and policy emerged as a formal school of thought with the contributions of a number of writers, as acknowledged previously. Within the classical school, profit–maximising was the key objective of the firm and it relied on long–term rational planning for achieving that objective, often through such means as the efficient allocation of resources and controlling the activities of a business through the structure. For instance, drawing on the early ideas of Alfred Sloan, and based on his own research, Chandler (1962) defined strategy as:

> the determination of the basic long–term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out those goals (p. 13).

As such, the predominant long–standing consensus within the classical paradigm has been that strategy should be a set of important decisions derived from a systematic decision–making process conducted at the highest level of an organisation (Hofer and Schendel, 1978: pp. 4–6; Mintzberg and Lampel, 1999). Hence, strategy fell within the responsibility of senior managers and staff planners who provided analytical support to them. As implied in these interpretations, the strategy process was also conceived as a top–down, controlled and concerted exercise that resulted in executable strategies (Hofer and Schendel, 1978: pp. 16–17; Mintzberg, 1990). Implied in the doctrines of this school is that planning deals with uncertainty through the deployment of analytical approaches to decision–making, thus allowing the organisation to capitalise on opportunities created by uncertainty and to take timely action in avoiding threats.

2.3.2. The Traditional School of Thought (1970s–1990s)

With the growing interest in the strategy concept within the business domain, numerous propositions have emerged, both supplementing and challenging the doctrines of the classical school. Over time, these contributions have culminated in a number of alternative frameworks, models and typologies. A notable aspect associated with this phase of development is a shift in emphasis from prescriptions towards descriptions of strategy (Mintzberg, 1978; Mintzberg and Waters, 1985) accompanied by a heightened attention to strategy–making (the process). For instance, Mintzberg (1978) carved a definition of strategy emphasising the patterns in a stream of decisions: "…when a sequence of decisions in some area exhibits a consistency over time, a strategy will be considered to have formed…" (p. 935). This era of strategy studies has also marked a change in the way strategy concept is perceived – viewing strategy as the positioning of the firm in an industry so as to avert and/or negate the threat of competitive forces (Porter, 1980), a move that has further extended the planning logic.

The descriptive approaches to conceptualising strategy have paved the way for examining the influence of contextual factors, such as the demographics and leadership styles of decision–makers, power and politics within the firm and organisational learning and culture, on strategy–making. The positioning approach has contributed to an increasing number of analytical concepts, frameworks and techniques, in addition to the already popular "Strengths–Weaknesses–Opportunities–Threats" (SWOT) analysis and "British Consulting Group" (BCG) matrix.

Examples of alternative models of strategy–making (mainly, as reflected in the behaviour of organisations) reported during this period include "linear–adaptive–interpretative" (Chaffee, 1985), "defenders–prospectors–analysers" (Miles *et al*., 1978) and "entrepreneurial–adaptive–planning" (Mintzberg, 1978). Mintzberg and Lampel (1999) later assembled ten different schools of strategy formation as depicted in literature, which were classified as either the prescriptive or the descriptive type.

2.3.3. The Contemporary School of Thought (1990s and beyond)

The contemporary school of thought comprises more comprehensive and dynamic processual models, evolutionary models and integrational frameworks. The central theme in scholarly discussions within this school has been the implicit or explicit integration of multiple perspectives, a move away from the previously held reductionist/dichotomous views, leading towards the adoption of more holistic frameworks (Barnett and Burgelman, 1996; Combe, 1999; Farjoun, 2002). This school of thought also reflects a shift in thinking about strategy formation towards synthesising the prescriptive and descriptive approaches into organic forms that emphasise organisational culture and learning, with an increasing recognition of the influence of organisational and environmental contextual factors.

Proponents of integrative and organic models point out the deficits of fragmented and mechanistic approaches to conceptualising strategy. They further argue that the models outlined previously are not robust enough to reflect the highly complex and increasingly dynamic attributes and behaviour of the individuals, markets and organisations that form the basis of strategy. The lack of multiple and reciprocal causality between various strategy constructs/elements has also been highlighted as another serious flaw in those models (Henderson and Mitchell, 1997).

Overall, these historical developments have represented a shifting perception and/or treatment of the strategy concept, from a quasi–scientific (analytical–prescriptive) through an art–like (evolutionary–descriptive) to a craft–like (integrative–organic) perspective.

The impetus for these alternative perspectives has been provided by the changing perceptions of the nature of competition among organisations and the sources of competitive advantage. For instance, during the formative stages of strategic management as a field of study (influenced by classical economics), it was believed that an organisation can enhance and sustain its competitiveness through the efficient deployment of resources alone. But with the dramatic shifts later witnessed in the business environment in terms of deregulated markets, changing customer preferences and technological advances etc., the

attention has moved towards a market–based view (also known as industrial organisation). The market–based view, which has had its primary focus on the external environment – market/industry dynamics (Brian, 1968; Porter, 1980), advocated positioning of the firm in an industry in order to gain full advantage from market imperfections or heterogeneity (Porter, 1985). Industry–focused approaches have later been criticised for their static nature and a lack of focus on internal resources and organisational factors (Mintzberg *at al*., 2003; Prahalad and Hamel, 1990; Rumelt, 1991). Subsequently, the focus has shifted in favour of a more comprehensive resource–based view (Barney, 1991; Wernerfelt, 1984), which was built on the premise that a firm's heterogeneous and relatively immobile resource endowments are the primary determinants of competitive advantage.

Today, it is widely agreed that the competition is about choosing the right markets and business activities, wisely exploiting new market opportunities, matching organisational capabilities with market needs as well as configuring business processes and mobilising resources in a way that averts and/or negates competitive threats – they all call for a dynamic and holistic approach to strategy that is underpinned by such characteristics as organisational learning, dynamic capabilities and flexibility.

2.4. Defining Strategy: Synthesising Multiple Perspectives

In recognition of these contemporary views, particularly the integrative and organic models, there have been renewed efforts towards developing a widely acceptable definition of strategy. For example, in an attempt to answer the question "What is strategy?", Hax (1990: p. 36) identified six critical dimensions to be included in any unified definition of the concept, as follows:

– it is the coherent, unifying, and integrative patterns of decisions a firm makes;

– it determines and reveals the organisation's purpose in terms of its long–term objectives, action programs and resource allocation priorities strategy as a definition of a firm's competitive domain;

– it selects the businesses the organisation is in or is considering entering;

– it is the attempt to achieve a long–term sustainable advantage in each of a firm's businesses by responding properly to both environmental opportunities and threats and the strengths and weaknesses of the organisation;

– it defines the economic and non–economic contributions the firm intends to make to its stakeholders; and

– it engages all the hierarchical levels of the firm – corporate, business and functional.

More recently, Frery (2006) has summed up most of the above aspects in what he called:

> the fundamental dimensions of strategy: creating value – defining the type of value expected and the way it is shared; handling imitation – preventing, implementing or leveraging imitation; and shaping the perimeter of the firm – setting the limits or [re]defining the scope of its business activities (p. 75).

Michael Porter (1996), a prominent advocate of the positioning advantage, has described strategy in a similar vein, in terms of positioning and focus, trade–offs and choice, fit and sustainability and growth and leadership in an iterative style around the central theme that "strategy is making trade–offs in competing". The essence of strategy, as he has claimed, "is choosing what not to do" (p. 70).

Given the sophisticated nature of the concept and the dynamic organisational settings in which it applies, there is a view that the efforts towards developing an absolute definition of strategy are futile. On the one hand, it may be virtually impossible to arrive at a single universal definition of strategy that captures all viewpoints and fits all situations. Nonetheless, there seems to be a core set of characteristics resonating whenever the term is interpreted by scholars and practitioners alike. The aspects like long–term goals, pervasiveness, direction and guidance, resource allocation, coordination and control have been portrayed as the key elements that characterise the strategy concept, from its very inception. On the other hand, the difficulties associated with the operationalisation of the concept (both at the research and the practice levels) are exacerbated by the lack of a

unified concept of strategy. As such, by way of synthesising the common elements in the above definitions, while considering the previously outlined evolutionary perspectives, this study has assembled the following working definition.

Strategy is the coherent, unifying and integrative patterns of decisions and actions that determine and/or shape the course of a firm in its pursuit of sustainable competitive advantage, particularly in terms of identifying and exploiting opportunities, anticipating and dealing with competitive forces and other changes in the business environment, avoiding or minimising unnecessary risks as well as allocating resources and developing organisational competencies (Frery, 2006; Hambrick, 1980; Hax, 1990; Porter, 1996).

2.5. Strategy Elements: Content, Process, Context and Outcomes

Presumably for analytical convenience, strategy has traditionally been studied in terms of content, process, context and outcomes (although, in reality, they are all intertwined and inseparable). Theoretically, this has meant examining the ways in which strategies are formed, their outcomes and the organisational settings in which they apply, along with the interactions among those elements.

In specific terms, the **content** of strategy has dealt with three aspects: the overall goals of the firm, the scope of strategy and the nature of specific strategies (Fahey and Christensen, 1986; Hofer and Schendel, 1978). The goals of the firm, which can be formally expressed in the form of objective statements or revealed as part of unfolding strategic intent (Hamel and Prahalad, 1989), may also imply desired performance levels. The scope of strategy indicates the span of control and the degree of pervasiveness of strategies pursued at each level of the organisational hierarchy. For example, studies of corporate–level strategy have typically focused on such issues as diversification, strategic alliances and geographical expansion (Fahey and Christensen, 1986). The strategies, per se, formally agreed upon or emerged as patterns in decisions and actions may be studied in numerous forms, such as programs, action plans, archetypes or stages of a firm's growth and evolution.

The **process** refers to the mechanisms or organisational processes through which strategies develop, be they deliberate or emergent, and the way they are realised through implementation via structure, control and change/performance management etc., or as witnessed in the form of progression of events and actions (Chakravarthy and Doz, 1992; Van de Ven and Poole, 1995). Strategy process research has traditionally focused on the effectiveness of alternative approaches to developing and implementing strategy and the influence of internal and external contextual factors on the process and its outcomes.

The **context** of strategy, or the organisational settings in which strategies are formed and realised, relates to the internal and external organisational factors that shape the content and process of strategy. Anecdotal as well as empirical evidence suggest that strategy process is contingent upon such diverse contextual factors as the nature of the business (product–market aspects), the level of competition, the size and maturity of the firm and organisational culture, as well as the demographics, personal attributes and the leadership styles of the key actors involved in the process (Fredrickson and Mitchell, 1984: Ketchen *et al*., 1996; Papadakis *et al*., 1998; Slevin and Covin, 1997).

The other important aspect that some authors have considered as the "linchpin" of strategic management is **organisational performance**. The link between strategy and performance has been the subject of research over a long period of time, and the majority of findings have supported a strongly positive relationship between the two (Miller and Cardinal, 1994). It has also been found that the ways in which strategies are formed under the influence of a multitude of internal and external contextual factors do affect the effectiveness of strategies in enhancing organisational performance (Dean and Sharfman, 1993; Ketchen *et al*., 1996; Slevin and Covin, 1997).

2.6. Strategy Process Research

Strategy–making (decision process) and implementation (change process) have been the heart of strategy studies for a long time. They are also, arguably, the most challenging and contentious areas of research within the strategy domain. Overall, strategy process

research has examined the alternative forms of strategy formation and change processes, including their effectiveness in achieving and/or sustaining superior organisational performance. The studies on decision–specific characteristics and their relation to strategy processes including the roles, attributes and behavioural aspects of the decision–makers and/or organisational actors involved in the strategy process have formed one sub–set of strategy process research. The influence of organisational contextual factors on strategy processes, including the links between various qualities and characteristics of the process, such as rationality/comprehensiveness, and on their outcomes, such as the effectiveness and organisational performance, has also been studied as part of strategy process research. Thus, the overarching rationale for studying strategy processes can be viewed as understanding the dynamics of strategy formation in order to inform organisations in their quest for superior performance.

Typically, these studies have used "units of analysis" that are at three different levels of analytical abstraction: cognitive processes and/or behaviours of individual decision–makers; organisational processes, including behavioural/social interactions among individuals/groups; and more generic or aggregated process models that include formal planning frameworks. Although the utility of the findings of research undertaken at each of those three levels may vary depending on the purpose of the study (for example, exploratory vs. theory building vs. theory validation, or rigour vs. relevance) and other circumstances under which a particular study is conducted, cumulative knowledge generated through research at all three levels has greatly contributed to advancing the knowledge and understanding of strategy processes. Moreover, as is the case with any other serious academic discipline, there have also been some healthy debates around the validity and relevance of knowledge generated through these alternative approaches.

The major reviews of strategy process/strategic decision–making research have developed and/or employed taxonomies that closely resemble the above streams of research for such purposes as evaluating the progress of the field, identifying emerging areas of research and guiding future research (Eisenhardt and Zbaracki, 1992; Huff and Reger, 1987; Rajagopalan *et al*., 1993; Schwenk, 1995). Apart from these studies that have evaluated

strategy process research more broadly and recommended ways of addressing the issues facing the field in general, a number of other studies have identified, examined and addressed more specific issues at each of the three levels of abstraction mentioned earlier.

At the most detailed level, the human condition and cognitive aspects of decision–making have been studied as part of strategy process research since the early stages of the field's development (Cyert *et al*., 1956; Dufty and Taylor 1962; Simon, 1955). Collectively, these studies have focused on the decision–making behaviour of senior executives or the top management which is commonly known as "upper echelons". They have examined such aspects as rational choice, bounded rationality, information seeking–information processing–evaluation behaviour, problem–solving, entrepreneurial insights, intuition and emotion leading towards developing theories or models of strategic decision–making (Hart, 1992; Hickson *et al*., 1986; Schwenk, 1995; Ungson *et al*., 1981).

The works by authors such as Cyert *et al.* (1956), March and Simon (1958) and Simon (1955) have marked an early shift in strategy process research as they acknowledged and addressed the limitations of the traditional economic model of strategic decision–making. The economic–rational model prevailing at the time consisted of three major elements: developing alternative courses of action; establishing the outcomes of those alternatives; and evaluating the alternatives in terms of the utility (profit) of their outcomes. This model, as in economic theory, relied on the key assumption that the decision–maker was a "rational, omniscient, lightning–quick calculator who chooses among well–defined alternatives in such a manner that maximised his/her utility" (Shubik, 1958: p. 292). Cyert and colleagues (1956) argued that although this model was adequate in describing what they called "programmed" decisions that covered "repetitive problems" and "tangible considerations", it was highly unlikely that the model accurately described the decision process relating to "non–programmed" decisions and/or unique situations (p. 238). The findings, based on the direct observations and the analysis of detailed descriptions of an organisational decision process, suggested that the two key elements of "search processes" and "information–gathering processes" should be incorporated into the traditional model if it was to adequately reflect the nature of non–routine decision–making.

The 1970s to early 1980s marked a significant increase in the number of empirical studies reporting on organisational decision processes. Prominent works published during this period include those by Cohen *et al*. (1972), Fahy (1981), Mintzberg *et al*. (1976), Narayanan and Fahy (1982), Quinn (1978) and Witte (1972). The majority of these studies have conceptualised strategic decision–making in the form of descriptive models consisting of phases, stages, steps and routines. Others have provided new insights into the political and behavioural aspects of decision–making, as opposed to the rational and analytical perspectives thus bringing to light the significance of a number of social parameters such as organisational culture, organisational structure and leadership style, in addition to the information–processing capacity and cognitive behaviour of individuals. Some studies have explored the patterns in strategic decision–making and examined the influence of certain organisational factors leading towards establishing alternative forms of strategy processes (Chaffee, 1985; Miles *et al.*, 1978; Mintzberg, 1978).

The vast majority of these studies, with reference to the strategy process as a whole, can be termed as micro–level analysis, and they have benefited by research undertaken in a number of other disciplines such as economics, biology, anthropology and psychology. Within this area, decision–making has often been described and/or modelled at the individual decision–maker's level in terms of the phases of a liner, sequential and often cognitive process depicting the characteristics of and the factors influencing the decision process and its outcomes (Mintzberg *et al*., 1976; Ungson, *et al*., 1981; Witte, 1972).

Despite the useful insights provided by these studies, there are several criticisms around a number of limitations associated with these micro–level models and the methodological approaches employed. Over–simplification, context–stripping, linear thinking, static modelling and the resultant fragmented and partial representation of phenomena all have triggered calls for a "complex dynamic decision perspective" (Cooksey, 2000; Johnson *et al.*, 2003). A growing interest in studying the role of middle managers in the strategy process, as opposed to upper echelons, as revealed by recent literature (Wooldridge and Floyd, 1990; Regner, 2003), has provided further support to these calls.

At the next level of abstraction, which can be termed as macro–level, decision–making has been treated as an organisational process, at a more aggregated level, as represented by interactions among individuals, group dynamics, change processes and organisational renewal. These studies have examined such aspects as organisational structure and culture, politics and conflicts, managerial styles and the demographics of decision–makers, along with other process characteristics such as comprehensiveness, participation and the speed of decision–making (Eisenhardt, 1999; Eisenhardt and Bourgeois, 1988; Fahey, 1981; Fredrickson, 1986; Narayanan and Fahey, 1982). The majority of these studies have endeavoured to model the strategic behaviour of firms in terms of major categories or archetypes (Cohen *et al*., 1972; Miles *et al*., 1978; Quinn, 1978).

A major limitation associated with research undertaken at this level is their limited generalisability across different and changing settings. For instance, models that emphasised political perspective of organisational processes have often discounted the significance of other perspectives such as rational decision–making and individual cognitive processes (and vice–versa). Nonetheless, their ability to explain strategy processes within the specific organisational settings in which those models have been derived remains high. Given the complex and context–dependent nature of strategy processes, some authors have argued that this is the appropriate level of analysis that can maintain the right balance between both the relevance and rigour of strategy process research (Miles and Huberman, 1994; Pettigrew, 1992; Van de Ven, 1992). As such, studies that have focused on organisational development and change (Pettigrew *et al*., 2001; Van de Ven and Poole, 1995) as a means of explaining the strategy process may also be included in this stream of research. However, they have taken more comprehensive and richer approaches in their analyses, as will be further discussed later in this section.

At the third level of abstraction, which can be viewed as the global or grand level, strategy processes have been modelled in the form of frameworks that depict key constructs such as the strategy process, its antecedents and outcomes, the organisational context in which they are developed, as well as the relationships between these constructs (Ketchen *et al*., 1996: Papadakis *et al*., 1998; Slevin and Covin, 1997). At this level, researchers have been

more interested in establishing cause–and–effect–type relationships between certain (assumed) dependent and independent variables, in order to predict the behaviour of the firm, than in examining the internal dynamics of the process. Understandably, the key objective of these studies has been to provide prescriptive guidelines to managers in making choices, especially in such strategically important areas as the scanning of the business environment, the positioning of a firm in an industry and the allocation of resources. This type of research has also been useful in developing analytical tools and techniques to be used in the formal strategic planning and strategy implementation. A significant problem with this type of (mainly deductive) modelling is the validity of the assumptions they are based on and, therefore, their lack of relevance to strategy practice.

The trade–offs and tensions between the studies operating at multiple levels of abstraction are reflected in the following comments made by Fredrickson (1986):

> most studies of the strategic decision process have produced either a very *focused* set of observations regarding one process question, or a very rich but *loose* description of the entire decision process (p. 282).

However, a number of leading scholars in the field have recently opened up new avenues of inquiry while advocating important perspectives that would further enhance both the rigour and relevance of strategy process research. For example, Chakravarthy and Dos (1992), Pettigrew (1992) and Pettigrew *et al*. (2001) have developed valuable insights into the critical strategy process issues and provided useful guidelines for conducting credible research in the area, whereas Van de Ven (1992) and Van de Ven and Poole (1995) have addressed the methodological issues confronted by researchers undertaking such research.

Pettigrew (1992) and Pettigrew *et al.* (2001) have argued for extending strategy process research beyond exploring the choice and change processes in order to recognise a number of new themes; action, dynamism, time, development and outcomes, and to explore the links between context, content and process as they interact over time. In addition, by way

of synthesising a body of literature in the social sciences domain, Pettigrew (1992) proposed five key principles for guiding strategy process research, as follows:

> studying processes across a number of levels of analysis and taking into account the temporal dimension, a role in explanation for context and action, a search for holistic explanation of process and a need to link process analysis to the location and explanation of outcomes (p. 9).

Chakravarthy and Dos (1992) emphasised the need for studying dynamic and evolutionary as well as transformational processes from multiple and complementary perspectives, using longitudinal and large–scale multidisciplinary studies. Van de Ven (1992) and Van de Ven and Poole (1995) asserted the importance of designing such studies informed by the underlying meanings and theories of process.

Although the scholarly tradition has been to examine strategy in terms of its constituent elements such as content, process and context, in reality, they are all intertwined. When Chandler (1962) defined strategy as "the *determination* of the basic long–term goals and objectives of an enterprise, and the *adoption* of courses of action and the *allocation* of resources necessary for carrying out those goals" (p. 13), by implication or intention, he was also capturing the process perspective of the concept – the ways in which strategies develop and/or are realised. Lately, there have been numerous calls for abandoning these dichotomous approaches to studying strategy (for example, process vs. content, deliberate vs. emergent) in favour of studies that simultaneously consider multiple aspects (Hart and Banbury, 1994; Huff and Reger, 1987; Pettigrew, 1992; Pettigrew, *et al*., 2001). However, such a move poses a number of challenges for researchers in terms of both the design of research studies and the organisation of resources. For instance, according to Pettigrew (1992), strategy process is "paradigmatically diverse and empirically complex" and the "postulates" defining the guiding assumptions of process analysis contain many "analytical riddles" (pp. 7–9). All in all, the foregoing review of strategy literature provides the background for synthesising and contextualising the developments in MS research, which will be undertaken in the remainder of this chapter.

2.7. The Manufacturing Strategy (MS) Concept and MS Formation Processes

MS is one of the central topics in the operations management (OM) field. It has been consistently cited as the single most important research area in virtually all major OM literature reviews published over the past few decades (Adam and Swamidass, 1989; Buffa, 1980; Neely, 1993; Pilkington and Fitzgerald, 2006). Recent studies have proposed extending the OM concept to supply chains (Lockamy III, 2004; Lowson, 2002; Walters, 2002). However, the reviews of MS/OS research have often noted the slow progress of the concept, particularly, with regard to its diffusion in the industry (Hill *et al*., 1999; Leong *et al*., 1990; Skinner, 1992; Swamidass, 1986). The vast majority of MS literature has embraced the early traditions of business strategy research, but has failed to keep up with the later developments in that field. MS process research has been overwhelmingly dominated by normative thinking with little or no regard for the other richer ways of describing and explaining the dynamics of MS formation. Studies of MS have also not progressed much beyond identifying constructs and establishing relationships between those constructs, using what some authors call "arm's–length" research. By comparison, strategy process research, as discussed earlier, has been able to yield a rich and robust knowledge base while drawing from a number of other intellectual domains. For example, strategy process studies have advanced the understanding of the dynamics of strategy formation across multiple levels of analytical abstraction, considering the varying and changing contexts. They have also addressed issues from multiple perspectives employing a wide range of methodological approaches. Although MS is treated as a sub–field of strategy, that level of richness, diversity and analytical and methodological rigour is not evident in most of the published MS process research (Barnes, 2000; Rytter *et al*., 2005).

The remainder of this chapter reviews and synthesises the current body of MS literature while drawing on appropriate aspects of strategy process research. In particular, this review focuses on the existing models, conceptual frameworks and taxonomies of the MS process, with a view to developing a conceptual framework that will inform the design and execution of the field–research component of this study. This will also serve as the basis for theorising from existing knowledge.

2.7.1. Defining Manufacturing Strategy: Articulating the Strategic Role

OM, over the years, has evolved into a more encompassing discipline with a growing focus on issues that extend beyond the traditional boundaries of the individual firm. This is partly reflected in the recent editions of an increasing number of text books that have adopted process, supply/value chain, value network and integrated perspectives of OM (Krajewski *et al.*, 2007; Samson and Singh, 2008; Slack *et al.*, 2006; Walters and Rainbird, 2007). Scholars of OS have also been responding to this trend by investigating strategic issues that cut across organisational boundaries (Baines *et al.*, 2006; Lockamy III, 2004; Lowson, 2002; Walters, 2002).

With its antecedents located in the areas of logistics and procurement areas, some scholars have viewed supply chain management (SCM) as the next phase of evolution of the OM discipline. As such, attempts have been made to extend the theoretical foundation of the OM discipline and broaden its scope to deal with the key inter–organisational issues such as relationships management, business process integration and the management of materials and information flows that cut across the traditional boundaries of the individual firm (Croxton *et al.*, 2001; Halley and Beaulieu, 2009; Lummus and Vokurka, 1999; Power, 2005). This has led to the conceptualisation of SCM as a functional area with a more encompassing scope and a greater mandate than those held by the existing functional specialisations of procurement, manufacturing and logistics. The functional view of SCM is supported by both the transaction–cost economics and resource–based perspectives of competitive advantage (Lockamy III, 2004; Skjott-Larsen, 1999).

Alternatively, there is also a more paradigmatic conceptualisation of SCM that is based on the network perspective of competitive advantage (Lockamy III, 2004; Mills *et al.*, 2004; Giannakis and Croom, 2004; Skjott-Larsen, 1999). Within the network perspective of SCM, which is based on the premise that competition is fought between supply networks as opposed to between individual firms, differentiation is achieved through developing inter–organisational relationships and the heterogeneous resources, capabilities and synergies created through such relationships (Lockamy III, 2004; Peck and Juttner, 2000).

However, several empirical studies have found that this holistic concept of SCM is far from being well–conceived by practitioners (Fawcett and Magnan, 2002; Storey *et al*., 2006; Skjott-Larsen, 1999). For instance, Storey and Colleagues (2006) reported that "few practitioners were able – or even seriously aspired – to extend their reach across the supply chain in the manner prescribed in modern theory" (p. 754). The same study has found that "predominantly, traditional inter and intra–organisational boundaries remain mainly intact while dyadic buyer–supplier relationships remained the mainstay of supply interactions" (p. 766). In their attempt to answer the key question of "who was managing the supply chain in practice?" the authors found that "very few instances where any such active agent could be identified" (p. 763). Fawcett and Magnan (2002) also found that "supply chain practice seldom resembles the theoretical ideal", and further claimed that "few companies have adopted and disseminated a formal SCM definition, and even fewer have meticulously mapped out their supply chains" (p. 344) to be able to know their supply chain partners beyond the adjacent tiers.

The concept of supply chain strategy (SCS) also remains not clearly articulated (Defee and Stank, 2005; Harland *et al*., 1999). The multiple definitions and conceptualisations, as well as some studies of SCS reflect the disparity between the functional and paradigmatic views of SCM (Lockamy III, 2004). For instance, Harland *et al*., (1999) interpreted that "the concept of supply strategy integrates various existing bodies of knowledge and concepts, to form a holistic, strategic perspective of management of operations, stretching across inter–organisational boundaries" (p. 663). Lummus and Vokurka (1999) described SCS as "the pattern of decisions related to sourcing product, capacity planning, conversion of finished product, deployment of finished product, demand management and communication and delivery" (p. 16). In investigating how two companies have developed and deployed differentiated SC strategies, Hilletofth (2008) focused on "how different manufacturing strategies are used in contemporary manufacturing related supply chains" (p. 16). These instances largely reflect the functional view of SCM. In contrast, Defee and Stank (2005) termed "developing differential advantage through supply chain related capabilities" as SCS, whereas Peck and Juttner (2000) argued that "supply chain strategy

deals with collective strategising between interdependent organisations" (p. 34). These interpretations reflect the network perspective of SCM. The above observations suggest that a deeper level understanding of the dynamics of MS formation could inform future research on SCS, rather than vice–versa.

Literature abounds with succinct definitions of MS such as "the development and deployment of manufacturing capabilities in total alignment with the firm's overall business strategy" (Swamidass, 1986: p. 471); "the effective use of manufacturing strengths as a competitive weapon for the achievement of business and corporate goals" (Swamidass and Newell, 1987: p. 509); and "a long–range plan or vision for the operations function" (Anderson *et al*., 1989: p. 137).

At the one end, these grand definitions are conceptually appealing, but arguably, so abstract that they render little support to practising managers as well as many researchers in operationalising the concept. At the other end, there are extended definitions like the following, which encapsulate the multiple perspectives discussed above and outline various elements of the concept which appear somewhat cumbersome.

> Major decisions about, and strategic management of: core competencies, capabilities and processes; technologies, resources; and key tactical activities necessary in any supply network, in order to create and deliver products and services and the value demanded by a customer/consumer. The strategic role involves blending these various building blocks into one or more unique, organisational–specific, strategic architectures (Lowson, 2002: p. 57).

There are also other interpretations offered by practising managers. For example, the operations manager of a large diversified industrial manufacturer summed up his ideas about the MS as follows:

> My interpretation of manufacturing strategy is structuring the major elements of manufacturing in such a way that it supports the other activities of the business which are primarily sales and marketing.

The manufacturing manager of a small technology–based firm offered the following ideas on manufacturing's contribution to business.

> Basically, our contribution is to fulfil customer requirements – to make customers happy. So, in essence, you go and win business from whatever the form it may be … and my job is to make things happen.

The above practitioner interpretations capture the essence of the conceptual understanding of MS, but they often reflect a restricted view in which the broader strategic perspective is missing. For instance, both of the above interpretations nicely capture manufacturing's core role of "execution" while recognising the importance of satisfying customer needs and the internal consistency among functional goals. But they simply treat them as their obligations without paying much attention to the strategic role expected of manufacturing; its contribution to the dialogue/debate at the business unit–level in agreeing on or acknowledging an appropriate set of competitive priorities. A lack of recognition of this critical aspect runs the potential risk of restricting manufacturing's role to a mere reactive or tactical one. Whilst acknowledging the challenge of reconciling these multiple perspectives and varying interests, the following definition is adopted in this study:

Manufacturing strategy is the conditional and consistent patterns of decisions and actions regarding the manufacturing structure and infrastructure of an organisation that determine and/or shape the resources, capabilities and work routines of its manufacturing system in supporting a set of competitive priorities agreed upon at the business–unit level (Anderson *et al*., 1989, 1991; Hill, 1992; Leong *et al*., 1990; Lowson, 2002: Platts *et al*., 1998; Schroeder *et. al*., 1986; Skinner, 1969; Swamidass, 1986; Wheelwright, 1984).

This definition falls in line with the broader view of business–level strategy presented earlier in this chapter. Thus, the emphasis on patterns of decisions and actions, as against programs and action plans, implies both deliberate and emergent perspectives of MS formation. Also implied in this definition are the role and scope of MS that establish its link to the business–level strategy. For instance, within a more formal and systematic

approach to strategy, an agreement on competitive priorities is reached at the business unit level. As part of this exercise, manufacturing is expected to articulate its strategic contribution to business unit–level strategy and garner the support of other functions for the same. This will then serve as the overarching framework for guiding decisions and actions within manufacturing that support capability–building as well as value creation based on agreed competitive priorities. In the absence of or even alongside formal planning, manufacturing decisions and actions may come about through an intuitive process of managerial interpretation of business environment and entrepreneurial instinct. Additionally, this definition allows the extension of the concepts of value creation and competitive priorities to suit a broader definition of SCS, as required.

2.7.2. Manufacturing Strategy: Content, Process and Context

Following the early tradition in business strategy literature, studies of MS have also been classified in terms of content, process and context. The MS **content** denotes the objectives of and the types of strategies (for example, the policies, choices, plans and actions) deployed by the manufacturing function in supporting the competitive strategy of the business (Anderson *et al*., 1989, 1991; Swamidass, 1989). As such, MS content literature has dealt with two key aspects: the choice of competitive priorities and the strategic decision areas (Leong *et al*., 1990; Schroeder *et al*., 1986).

Building on Skinner's (1969) original work, which defined "manufacturing task", and based on their own earlier work, Hayes and Wheelwright (1984) articulated four competitive priorities: cost, quality, delivery and flexibility, as strategic preferences or the ways in which an organisation chooses to compete in the market. Later contributions have expanded on this list to include such dimensions as service and innovation (Ahmad and Schroeder, 2002; Leong *et al*., 1990). By choosing to configure its manufacturing system to support a particular set of competitive priorities, a firm attempts to offer a customer a value profile that is unique or rare within a target market. The appropriate set of priorities should, preferably, be agreed upon through dialogue and debate between marketing and operations, based on a sound understanding of the characteristics and the needs of target

markets and the profile and capabilities of manufacturing processes (Berry *et al*., 1995, 1999; Hill, 2005), although it may not always be the case in practice. In line with the doctrines of the supply chain/value network perspective, this agreement may ideally be extended to cover the whole supply chain so that differentiation is based on both the intra and inter–organisational relationships and the heterogeneous resources, capabilities and synergies created through such relationships (Lockamy III, 2004; Peck and Juttner, 2000).

Manufacturing systems consisting of facilities, plant and equipment as well as people and processes can be treated as socio–technical systems (Chase, 1980; Rytter, 2005; Smith and Robey, 1973). Business decisions regarding the design and operation of such systems deal with hardware–related issues such as the location of facilities, choice of technology and capacity of plants, as well as such soft issues as management and control of business processes, training and motivation of employees, development of capabilities and introducing new technology (Chase, 1980; Samson and Whybark, 1998).

Table 2.1: Strategic Operations Decision Areas

Structural Decisions	Infrastructural Decisions
System capacity: planning, addition	Operations planning and control: policies/procedures
Facilities: location, layout	Organisation: structure, communication
Process positioning/vertical integration	Workforce: attributes, skill levels
System design/process selection	Quality: systems, practices
Technology: choice, acquisition	

The scope of these decisions and actions is, in part, what sets a functional strategy apart from its business and corporate–level counterparts. In Skinner's (1969) seminal work, these decisions were classified into two categories, structural and infrastructural, as listed in Table 2.1 above. Over time, these decisions, which are often conditioned by business–level strategy, employees' current skill levels, organisational values and managerial styles shape the character and capabilities of the operations system, which will eventually determine its ability to support the desired competitive priorities. These decision areas can be reframed to suit supply chain contexts, albeit the challenges to their operationalisation.

However, compared to business and corporate–level strategies, MS may be less explicit in that it often does not exist in documented form. Therefore, MS is best captured as consistent patterns in a stream of decisions and actions regarding the manufacturing structure and infrastructure of an organisation (Mintzberg and Waters, 1985).

The **process** aspect of MS has traditionally been viewed as part of, or in an equivalent form to, the top–down rational planning model popularised by the early business–strategy scholars. This formulate–then–implement type approach starts with identifying manufacturing objectives that support overall business goals and an evaluation of current capabilities and resources, along with an assessment of their ability to meet those objectives. It then attempts to find ways of bridging any gaps between the current and expected levels of manufacturing performance, in order to meet the set objectives. This approach corresponds to the popular SWOT (strengths–weaknesses–opportunities–threats) analysis used in the development of business–level strategy. Strategies so developed are realised through the allocation of additional resources, improvements in operations practices and restructuring of the manufacturing system, in order to enhance the fit and alignment with the business as well as the other functional strategies. Underlying this overall process is a series of interrelated decisions and actions that revolve around identifying trade–offs, setting priorities, making informed judgements and choices which form the core of managerial undertakings. An emergent view of MS formation recognises the consistent patterns in these decisions and actions as MS.

Manufacturing managers make decisions and take actions within the broader **context** of the organisation and its business environment. That means their decisions and actions are conditioned by what is happening within the business (for example, goals and expectations of other functional areas such as marketing and finance), as well as outside the business (for example, competitor initiatives and changing market needs). Therefore, it is important that manufacturing decisions and actions are internally consistent and coherent on their own, as well as across other functional areas, and are aligned with the overall business strategy. Ideally, they may also be contingent upon the unique yet evolving organisational settings such as those discussed earlier as alternative perspectives. It can be theoretically

argued that, compared to business–level strategy development, the scope of manufacturing decisions is limited and the impact of some external forces would be less relevant, due to the expectation that they should have already been dealt with at the business unit level. However, the validity of such arguments is undermined by the emerging perspectives of supply chain and/or value networks that advocate network–based supply/value strategies.

Nonetheless, strategy formation in practice is not an orderly, logical and neatly hierarchical process as such. More often than not, manufacturing managers act under constant pressure from all quarters as they try to reconcile conflicting demands placed on them (Westbrook, 1995). For instance, developing capabilities for the long haul is a noble goal of MS, but this has to be fought with against increasing pressure for maximising the short–term bottom–line performance in the context of fierce competition. There is also the possibility that managers may act to serve their self–interests or to exercise their power. Thus, managers' decisions are either consciously or subconsciously affected by a wide range of individual and organisational factors. However, to what extent managers can be rational in their decision–making is a question that has not been fully answered.

Finally, similar to its business–level counterpart, **manufacturing performance** is measured in terms of its ability to support an agreed set of competitive priorities. Typical measures include product/service cost, quality, delivery speed/reliability, productivity, inventory turnover, new product development cycle time (time–to–market) and the number of order change requests accommodated. The strategic approach to manufacturing management advocates the development of performance measures to reinforce both short–term and long–term objectives of manufacturing, activity–based costing in place of traditional cost accounting, as well as the performance management systems that incorporate holistic and supply chain wide perspectives (Devaraj *et al*., 2004; Hayes *et al*., 1989; Neely *et al*., 1994; Richardson *et al.*, 1985; Souza and Williams, 2000; White, 1996). Literature on manufacturing performance abounds with dozens of approaches and hundreds of measures emphasising both the efficiency and the effectiveness – extending to supply chains. In addition, organisations tend to use numerous measures of their own, reflecting the above parameters (for example, delivery in full on time and stock–fill rate).

2.8. Manufacturing Strategy in Practice

Despite all the intellectually compelling arguments supporting the concept of MS and the prescriptive guidelines available for its formulation and implementation, it still appears that many manufacturing managers are not adept at operationalising those concepts (Hayes and Pisano, 1994; Kim and Arnold, 1996; Slack *el al*., 2004; Swamidass, 1986). Possible reasons for the lack of adoption and diffusion of scholarly contributions among practitioners are many and varied.

A view shared by many OM scholars is that the way the OM field has evolved is a major cause of this problem (Buffa, 1980; Smith and Robey, 1973; Wainwright, 1997). For example, citing a number of sources, Wainwright (1997) asserted that "manufacturing systems in the United Kingdom (UK) have evolved though periods of uncontrolled growth … and this has resulted in manufacturing goals that are inconsistent with the overall business strategies" (p. 53). Similar and more deeply rooted issues, covering such diverse aspects as people and their attitudes, manufacturing systems, organisational practices and culture witnessed across firms and industries around the world have been comprehensively treated in the works of leading authors such as Hill (1989), Hill *et al.* (1999), Skinner (1992) and Hayes and Wheelwright (1984) and more recently by Slack *et al*. (2004).

Another major issue is that the existing models of MS and associated prescriptions do not adequately reflect what is happening in practice – they are too simplistic, too rational and highly abstract and, therefore, have not been very useful to practising managers. This situation has been privy to the research frameworks used in the OM domain (Meredith, *et al*., 1989). OM scholars have traditionally followed normative and deductive approaches to research and have used quantitative modelling and simulations as their primary research methods. Although such approaches have been well suited for studying the conventional hard aspects such as facility location, materials planning and scheduling of socio–technical systems, they are inadequate for examining the emerging soft aspects of OM such as MS (Meredith, 1998; Samson and Whybark, 1998).

2.8.1. Major Improvement Programs as Manufacturing Strategy

Lately it has been witnessed that organisations are indiscriminately adopting major improvement programs (such as total quality management, lean operations, business process re–engineering and six–sigma) rather than taking a holistic and systematic approach to formulating and implementing an MS. Some authors have treated these programs synonymous to OS (Ahmed *et al*., 1996). A significant body of OM research has examined the choice of major improvement programs or best practices and their contribution to manufacturing performance (Cagliano and Spina, 2000; Flynn *et al*., 1997; Harrison and Storey, 1996; Kim and Arnold, 1996). These studies have marked a shift away from following the formal planning route or the tracking of consistent patterns in strategic decisions and actions as the basis of MS. The popular improvement programs that have proved their worth through the experiences of high–performing or "world–class" organisations are assumed to be internally consistent, but the challenge still remains with the selection of those "off–the–shelf" programs in order to align with the overall business–level strategy and to fit with the unique organisational settings (Garvin, 1993; Kaufman, 1997; Spina, 1998). Moreover, the works of leading authors like Hayes and Pisano (1994) and Skinner (1988) have questioned the whole notion of using the so–called "best practices" in place of a comprehensive MS.

2.8.2. Specific Organisational Practices as Manufacturing Strategy

Other empirical studies have examined the use of specific organisational practices such as benchmarking, continuous improvements/incremental innovations, outsourcing/off–shoring, quality function deployment, workforce empowerment, gain–sharing and the adoption of advanced technology as the basis for enhancing competitiveness. For instance, some authors have particularly focused on continuous improvement, specific operations practices and the adoption of new technology and their links to operations performance (Chapman and Highland, 2000; Corbett and Campbell-Hunt, 2002; Gordon and Sohal, 2001; Mellor and Gupta, 2002; Morita and Flynn, 1997; Narasimhan *et al*., 2005).

Voss (1995) has conceptualised empirical observations similar to those outlined above, using what he called "three different paradigms of choice and content" (p. 6), namely, competing through capabilities, strategic choices and best practice. In a similar vein, Swamidass *et al.* (2001) used the four–stage model of manufacturing's strategic role (Hayes and Wheelwright, 1984) to map out three alternative forms to top–down planning namely, "a coherent pattern of actions, manufacturing/process improvement programs and the pursuit of core manufacturing capabilities" (p. 1289).

2.8.3. Entrepreneurial Initiatives as Manufacturing Strategy

However, there are other firms (particularly smaller ones) that are successful but have not been inclined to adopt major improvement programs, a coherent set of organisational practices or a rational planning approach to strategy (Stonehouse and Pemberton, 2002). Small firms operating in niche markets are rarely organised around functional specialisations and they often lack specialist staff and other resources required in the formal planning. They are also not likely to embrace the off–the–shelf solution packages, given their financial capacity and the scale of operations. Their competitive success is best described by their innovative capacity and behaviour, which are primarily driven by the entrepreneurial characteristics and personal aspirations of their owner–managers, enabling them to identify and successfully exploit market opportunities (Anderson and Atkins, 2001; Brouthers *et al.*, 1998; Davig and Brown, 1992).

Overall, these observations reflect the alternative manifestations of what can be called the "content" of MS or MS "archetypes", while emphasising the challenges associated with the deployment of a universal model of MS. However, they are consistent with the notion that the underlying patterns of decisions and actions could be considered as the common building blocks of MS. As such, it is imperative that the conceptual understanding of MS reciprocates what is available in the form of empirical evidence relating to practice.

2.9. Manufacturing Strategy Process Research

Presumably, the first conceptual framework of MS (Skinner, 1969: pp. 143–145) articulated the process of "manufacturing policy determination" in terms of an orderly process consisting of a sequence of steps. It comprised key elements such as external contextual factors, internal resources and capabilities, business strategy, manufacturing objectives, manufacturing policies and performance outcomes and the relationships among those elements, as shown in Figure 2.1 below.
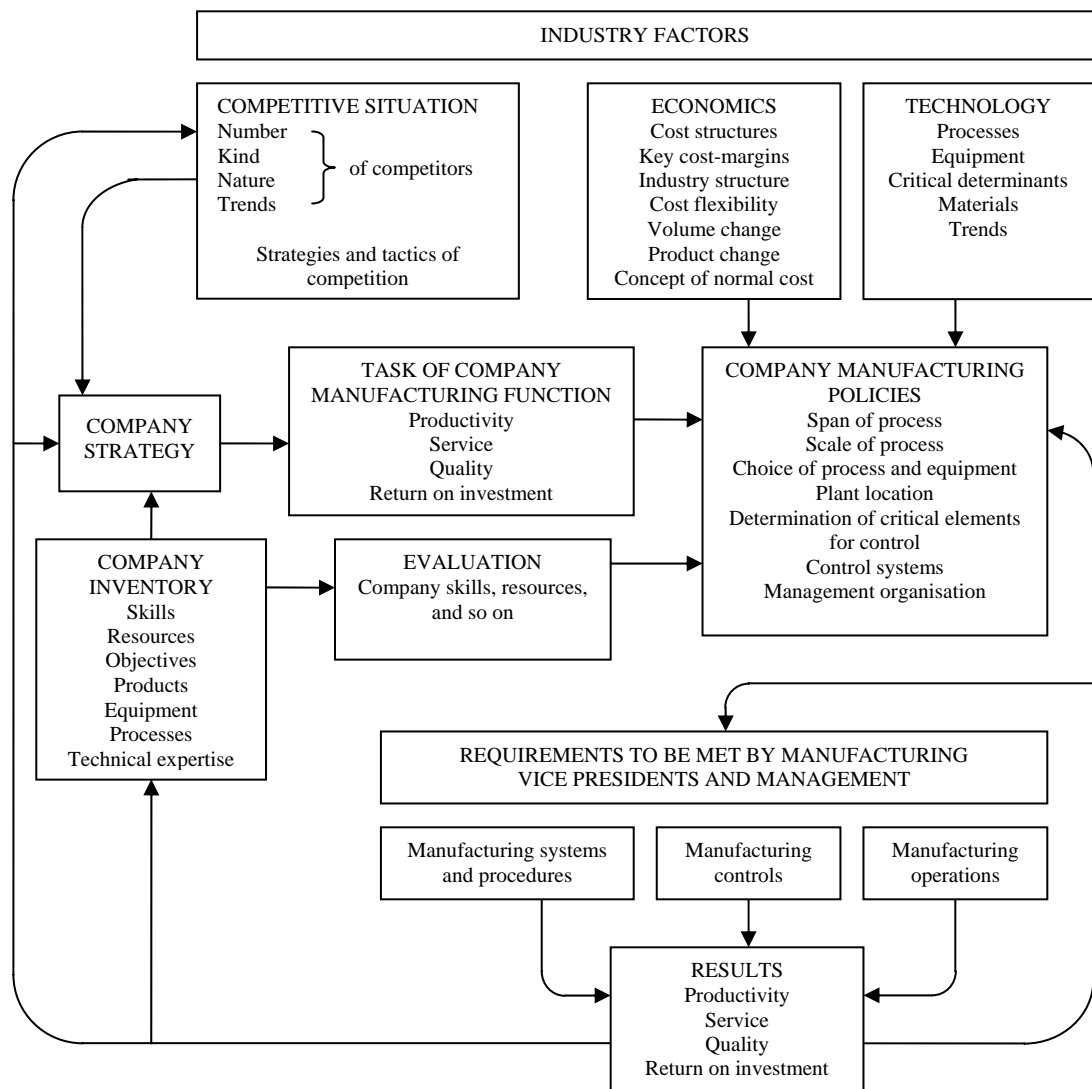
Figure 2.1: The Process of Manufacturing Strategy Determination
(Source: Skinner, 1969)

This framework was heavily biased toward the top–down planning model of strategic management prevailing at the time and the process of MS development closely resembled the SWOT analysis prescribed in strategy literature. However, later works have recognised the emergent perspective of MS formation as well (Wheelwright, 1984; Hayes and Wheelwright, 1984). For instance, Wheelwright (1984) emphasised that: "… a manufacturing strategy is determined by the pattern of decisions actually made (what managers do), not by what the business says its manufacturing strategy is …" (pp. 85–86). Since then, the progress of MS process research has been evidenced in several fronts. Firstly, much of the early efforts that followed Skinner's (1969, 1971, 1974) intellectual enlightenment contributed to articulating the strategic role/significance of manufacturing and further refining the concept by elaborating the key elements of it (Hayes and Wheelwright, 1984; Swamidass, 1986; Wheelwright, 1978, 1984).

The primary focus of these early efforts has been on articulating the MS concept through conceptual reasoning rather than advancing process understanding through empirical studies (Anderson *et al*., 1989; Samson and Whybark, 1998). For instance, Skinner's (1969) framework depicted relationships between industry factors, organisational resources/capabilities and performance parameters in prescribing how to determine manufacturing objectives and policies. This framework emphasised the manufacturing implications of business strategy in identifying a manufacturing task, studying the impact of industry factors in understanding manufacturing problems/opportunities and the need to synthesise the above perspectives in developing manufacturing policies that support competitive strategy. Finally, it advocated devising programs, controls and performance measures, in order to fulfil the manufacturing task. Wheelwright (1984), while further elaborating on Skinner's framework, emphasised the need for ensuring internal consistency among decisions and aligning of manufacturing policies, structure and infrastructure with business strategy and competitive needs on an ongoing basis. However, the underlying process dynamics or the organisational processes that form the basis of such frameworks had rarely been subjected to rigorous empirical investigation. Apart from the above framework proposed by Skinner (1969), several other normative frameworks and models have appeared in MS literature. These include Anderson *et al*. (1991), Garvin

(1993), Kim and Arnold (1996), Leong *et al*., (1989), Mills *et al*. (1995) and Schroeder (1986). Schematic representations of these frameworks/models are given in Appendix 1. Although the vast majority of these studies had been informed by the then–popular market–based view of competition, subsequent studies (Acur and Bititci, 2004; Gagnon, 1999; Schroeder *et al*., 2002) have also examined the implications of the resource–based perspective on MS. These contributions have culminated in more complete and robust, but predominantly normative, models and frameworks of MS, incorporating both market–based and resource–based perspectives (Lowson, 2003b; Slack and Lewis, 2002; Swamidass and Darlow, 2000). The essence of the top–down planning approach, as conceptualised by Swamidass and Darlow (2000), is reproduced in Figure 2.2 below.
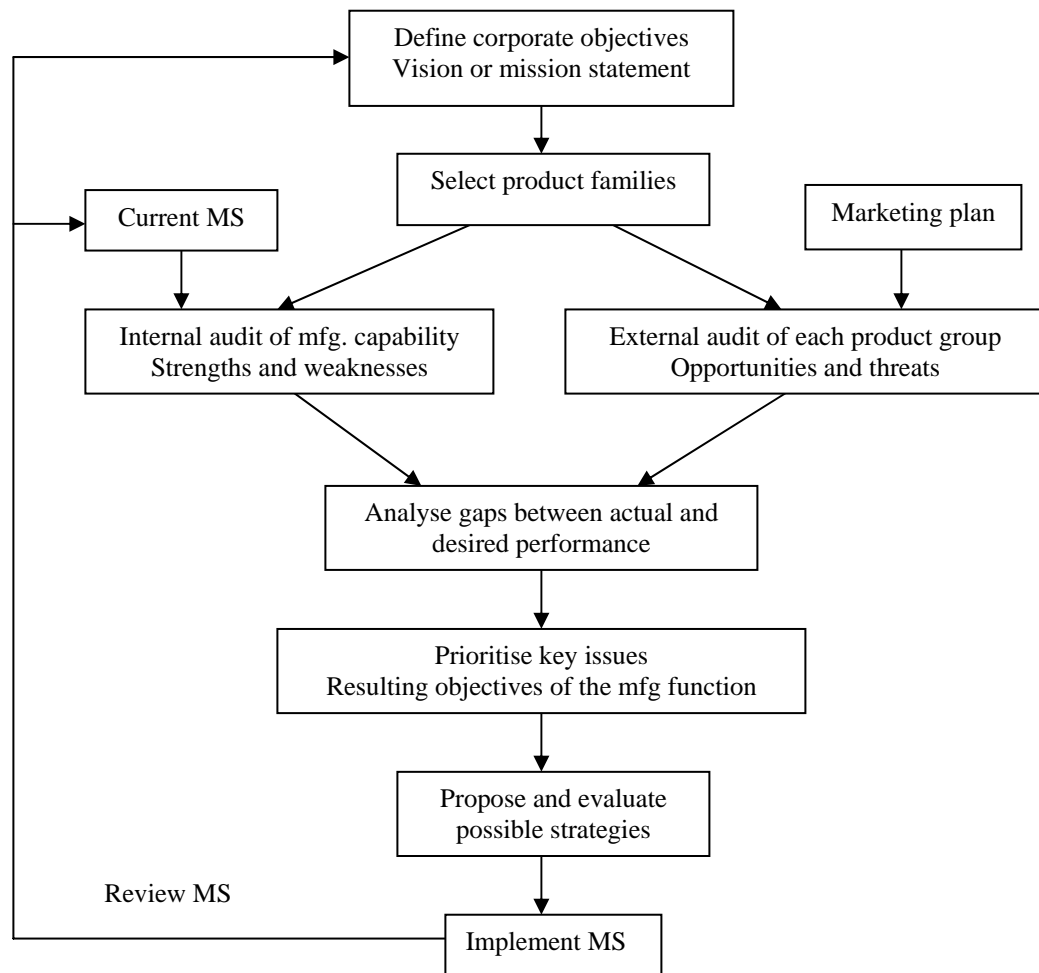
Figure 2.2: A Process for Developing Manufacturing Strategy
(Source: Swamidass and Darlow, 2000: p. 420)

54

A more recent conceptual model proposed by Rusjan (2005), shown in Figure 2.3 below, reflects both the market–based and resource–based perspectives as well as the current conceptual understanding of the MS process and content, including the linkages between the elements of business strategy and functional strategies.
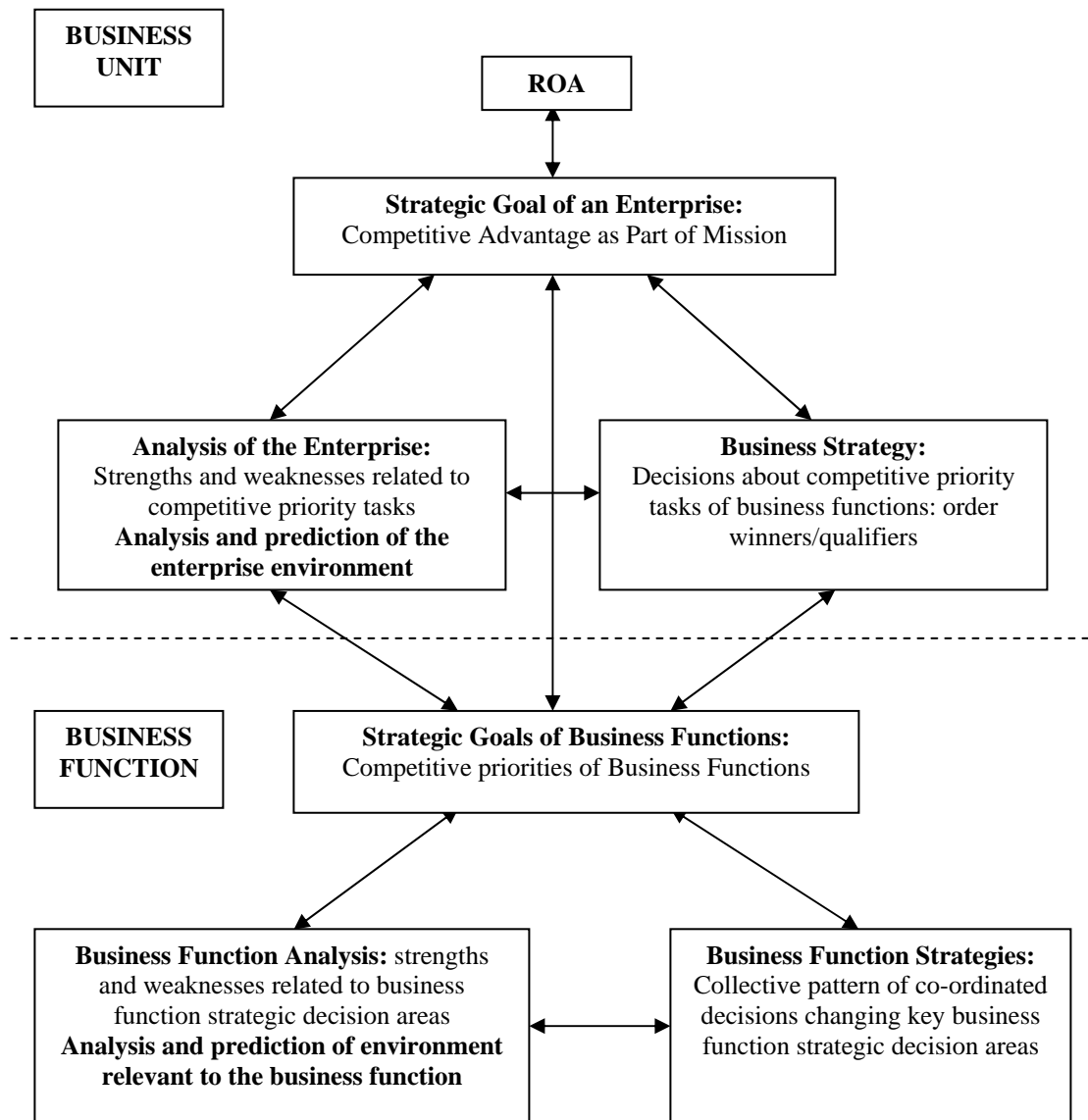
Figure 2.3: Connectedness between Processes of Strategic Planning of an Enterprise and of a Business Function (Source: Rusjan, 2005: p. 747)

A second and still growing stream of scholarly work has focused on operationalising the concept through various means: disaggregating the macro–level constructs of the above models and frameworks into less abstract elements, including the use of various display formalisms to capture and/or describe MS processes in practice; devising alternative ways of applying the concept; and developing analytical tools and techniques to assist with MS development (Berry *et al*., 1995, 1999; Cagliano and Spina, 2000; Cleveland *et al*., 1989; Fine and Hax, 1985; Garvin, 1993; Hill, 1989; Kim and Arnold, 1996; Mills *et al*., 1998; Platts and Gregory, 1992; Tan and Platts, 2004; Vickery, 1991).

A third stream of research has explored the links between MS and other broader aspects such as organisational context, environmental conditions and business performance at a more abstract level, thereby positioning the MS concept within the broader context of business and corporate level strategies (Anderson *et al*., 1991; Ho, 1996; Leong *et al*., 1989; Mills *et al*., 1995; Swamidass and Newell, 1987; Ward and Duray, 2000; Williams *et al*., 1995). Studies within this category have used both conceptual reasoning and empirical data to establish relationships between major constructs of the MS process, content, context and performance. However, due to the inherent limitations of the methods used and the level of analytical abstraction employed, most of the empirical studies within this stream have only been able to examine the relationships from a limited, single–variable perspective, thereby casting doubts as to the validity and relevance of those measures. These studies have, in general, dealt with both the MS content and process, but in most cases, they have emphasised the process perspective.

In addition to the above three major streams of research, rather isolated efforts aimed at developing MS process models and decision support systems, mainly using simulation and quantitative techniques, have also been reported in literature (Doumeingts *et al*., 2001; Munive-Hernandez *et al*., 2004: Wainwright, 1997; Wainwright and Ridgeway, 1994).

There are a few salient features shared by all three of the major streams of research mentioned above. Firstly, they have been strongly influenced by the rational top–down planning approach to strategy. Secondly, a vast majority of those studies have

conceptualised the MS process at a highly abstract level. Thirdly, they have often used quantitative approaches, thus leaving out the rich interactions and organisational processes that form the basis of MS formation. Despite the early acknowledgement of the alternative manifestations of MS and deliberate and emergent perspectives, there are no clearly articulated alternative models of the MS process available in literature. This situation marks a significant disparity compared to the advancements (as outlined earlier) evident in the broader area of strategy process research. Moreover, a lack of deeper understanding of MS processes, which can be partly attributed to the absence of such alternative conceptualisations, may also have contributed to the slow penetration and progress of the MS concept within the industry. However, a few recent studies have marked a movement away from this long–standing tradition (bias).

Swamidass *et al*. (2001), in their study involving three United Sates manufacturing firms, used a process–mapping approach to capture three evolving alternatives to the popular top–down planning approach used in OS development, namely, a coherent pattern of actions, major improvement programs and the pursuit of core operations capabilities. For instance, consistent patterns of incremental decisions and actions have represented step–wise but focused investments in the operations system aimed at meeting specific competitive priorities. Barnes (2002) used six case studies of small manufacturing firms in the UK to conclude that OS is formed in a complex process of managerial interpretation under the influence of individual, cultural and political factors. Although a number of previous studies have also attempted to capture the MS/OS process in practice, using alternative approaches and techniques such as qualitative methods, process–mapping and strategy charts, they have largely operated within the rational planning framework (Cheng and Musaphir, 1996; Dangayach and Deshmukh, 2001b; Darlow and Baines, 2000; Marucheck *et al*., 1990). Other more recent studies have broadly recognised the "equi–finality" as well as the co–existence of rational planning and alternative, often emergent, forms of MS formation (Lowson, 2002; Nielsen-Englyst, 2003).

Collectively, these empirical studies have asserted that the many ways in which operations/manufacturing strategies are formed in practice are neither accurately captured

nor adequately explained by the rational planning models alone. They have also provided useful insights into the MS/OS formation process, which have highlighted the pluralistic nature of successful strategies pursued by organisations and have explored the influence of several internal and external contextual factors on the MS/OS process. However, they have fallen short of articulating a comprehensive alternative framework or model of MS formation. Therefore, there is a clear need for explicating the deeper structures of MS formation, particularly based on empirical data to augment the limited understanding provided by the existing rational planning frameworks. As a first step in that direction, this literature review has synthesised the currently available knowledge on MS as represented in the following conceptual framework (Figure 2.4).
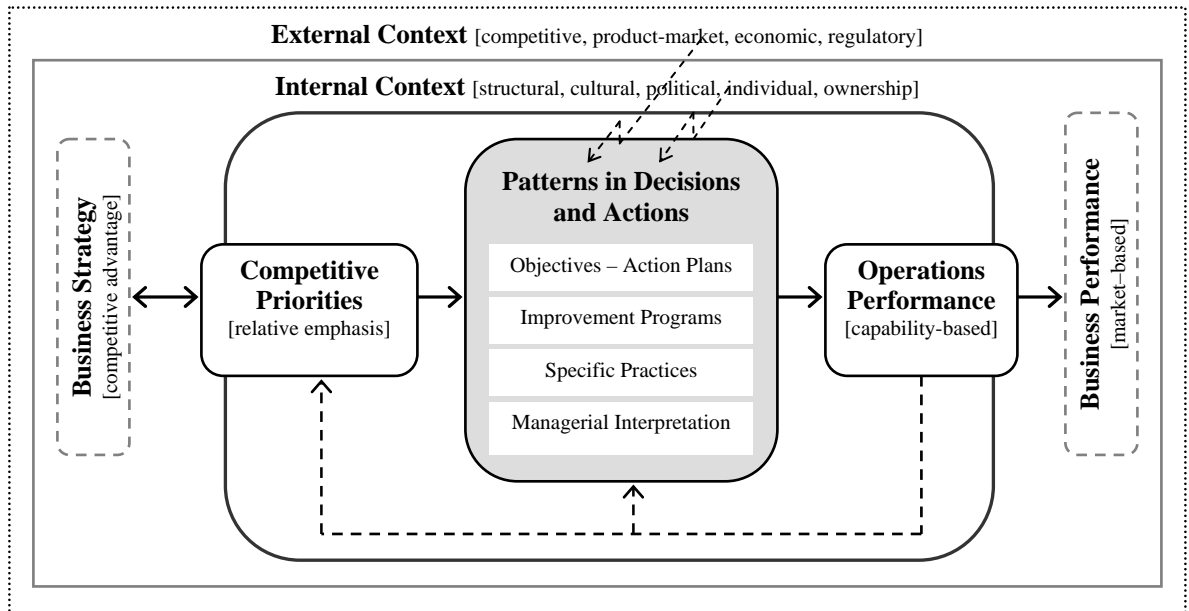
Figure 2.4: Conceptual Framework for the Study of the MS Process

Given that the MS process, content and context are intertwined and inseparable, this framework is essentially a partial representation of the MS concept from a process perspective. Within the limitations imposed by the simple formalism used, this framework depicts the multiple dimensions and complexities associated with the MS process. Firstly, it accounts for both the deliberate and emergent perspectives of MS formation by way of recognising the patterns in decisions and actions as well as the presumed links between

MS, business strategy and business performance. Secondly, it portrays multiple levels of analytical abstraction: MS formation and associated major constructs within its broader context of business strategy – as represented by the dark continuous border–line; MS formation as a proverbial "black box" – at the centre; and the limited understanding ("grey" preferred over "black") of what is happening inside the black (or grey) box – crude patterns of strategy formation. Thirdly, it indicates the influence of internal and external organisational contextual factors on MS formation and feedback loops – as represented by dashed arrows. In addition, the framework acknowledges a number of assertions relating to the MS process that have been reported in literature: the need to (explicitly or implicitly) agree on competitive priorities at the business unit level – as represented by a two–way arrow; the hierarchical/causal links between competitive priorities, MS formation and operations performance – as indicated by one–way arrows; and the possibility of alternative forms of MS formation.

Notwithstanding the obvious overlaps among them, the different layers of analytical abstraction portrayed in the framework closely resemble the three types of process referred to by Van de Ven (1992).

At the most abstract level, the MS formation and associated major constructs can be studied in the form of a basic "input–process–output" configuration in that they are based on the assumed causal relationships between competitive criteria, strategy formation and operations performance. MS formation, at this level of abstraction, is represented by a black box as depicted in the above conceptual framework, with the primary input to it coming from business strategy, in the form of competitive criteria. Thus, the relative emphasis on certain competitive priorities along with the desired vs. current level of operations performance with regard to those priorities inform the way(s) in which MS is formed. The intermediate outputs represent the enhanced operations performance against key competitive priorities that enables the operations function to contribute to competitive advantage, resulting in (assumed) superior business performance. As such, OS literature, in general, recognises the role and significance of performance measurement/feedback, as indicated by the dashed arrows in the figure.

Studying MS/OS processes at the above level of abstraction allows observation of how changes in input (independent) variables relate to output (dependent) variables even if one does not know exactly what is happening inside the process black box. For instance, the relationships among competitive criteria and operations performance can be examined, using some process logic, to explain the relationship between the chosen priorities and operations performance under varying contexts. Studies such as those by Ho (1996), Swamidass and Newell (1987), Ward and Duray (2000) and Williams *et al*. (1995) are all examples of this kind of research. These studies have rarely described or explained what is happening inside the process black box.

Secondly, the framework (as portrayed in a lower level of analytical abstraction) depicts a crude picture of what is happening inside the black box. At this level of analysis, constructs such as objectives, action plans and improvement programs can be delineated from each other and the links between those constructs could be confirmed, preferably based on empirical data. The findings of these studies could then be used, for example, to confirm whether or not strategy formation follows the formulate–then–implement sequence but perhaps no more detail than that. The most detailed studies published on the MS process so far fall into this category (Cheng and Musaphir, 1996; Dangayach and Deshmukh, 2001b; Garvin, 1993; Kim and Arnold, 1996; Marucheck *et al*., 1990).

A significant limitation of the above studies is their reliance on positivist assumptions that barely reflect the dynamics and the complexities of MS formation in practice. However, as noted earlier, the findings of a few recent studies have already begun to develop important insights into the MS process at a more detailed level. These findings will be further discussed in Chapter 6.

All in all, the above conceptual framework demonstrates that the current level of knowledge in the MS area is not adequate to extend the understanding of the MS process beyond identifying categories, concepts and broad constructs such as priorities, objectives and action plans and their macro–level linkages. A lack of detailed process understanding acts as an impediment to the operationalisation of the MS concept. It further shows that

the current understanding of the MS process is strongly anchored in the formal planning paradigm (as rooted in the positivist school of thought) and the current level of knowledge reflects little about the emergent perspective of MS formation. Also, it confirms neither the intertwined nature of strategy formulation and implementation nor the non–linearity of the strategy process that have been widely accepted in the strategy–process literature.

As such, synthesising the existing knowledge in the above form alone is not adequate to address the research questions identified in the study. Given the limited knowledge of process dynamics that can be developed through synthesising existing literature, the empirical validation of the above conceptual framework may not make a significant contribution to the research and practice of MS. To explain HOW and WHY the relationships/links (outlined above) exist one way or the other, it is necessary to get even closer to the process (at a still deeper level of analytical abstraction) in order to examine the movements of lower–level events, activities, actions and the roles of key actors involved and possibly to reconstruct the phenomena for the purpose of explaining the process with some causal understanding – that is, opening up the black box. This could lead to revealing the deeper structures of MS formation as patterns in the ways in which events, actions and decisions unfold over time. Exploring such deeper structures is the aim of this study. Therefore, the focus of the field study is on process attributes, such as the role–specific aspects and the intermediate steps of the process, including their temporal dimension, as they emerge grounded in empirical data – this involves extending the level of analysis across traditional analytical boundaries.

In the above context, a key role of the conceptual framework is to provide the broad direction required in the design and execution of the field study. It has identified the elements of the MS process within its broader context, initial parameters of interest as well as some tentative relationships among these elements. Along with the methodology literature reviewed, it will also help develop the research protocol by providing guidance in identifying and selecting appropriate sources of data, participants and case companies, which will be further illustrated in Chapter 3.

2.10. Chapter Summary

A normative approach to MS/OS advocates the identification, agreement and definition of competitive priorities based on target markets at the business unit level. The essence of this hierarchical planning approach is developing and deploying operations capabilities for supporting the agreed competitive priorities. Underlying this approach are managerial decisions and actions regarding the operations structure and infrastructure of the organisation. The dynamics of this approach are underpinned by the intricacies of the influence of internal and external organisational contextual factors. Various aspects of this approach have been empirically tested, but there is no consensus on one best way of operationalising the conceptual prescriptions associated with it. Alternatively, an emergent view of strategy recognises the significance of consistent patterns in decisions and actions as the basis of studying MS/OS. In addition, the current practice indicates that firms successfully pursue such alternatives to the formal planning approach as major improvement programs, specific organisational practices, and the consistent entrepreneurial behaviour of individuals.

Strategy process research has drawn from disciplines as diverse as sociology, psychology, biology and economics. It has examined a wide range of topics and issues pertaining to the individual behaviour, organisational processes and contextual factors associated with strategy–making, as well as change processes and performance outcomes. The findings have been presented in terms of numerous descriptive and analytical models at multiple levels of abstraction. The process understanding advanced through these models has been supplemented by the studies of human cognition and behaviour that have examined individual decision–making and group interactions. However, it is widely agreed that the strategy process, as a whole, can be comprehensively understood by studying it at the macro–level mentioned earlier. Although MS is treated as a sub–field of strategy, that level of richness, diversity and analytical and methodological rigour is not evident in MS process research.

Apart from the significant body of conceptual work that has dealt with the various aspects of, and issues relating to, the MS process, there are several empirically derived process models and frameworks. However, they have been strongly influenced by the rational top–down planning approach to strategy. In addition, a vast majority of previous studies have conceptualised the MS process at a highly abstract level. Moreover, they have often used quantitative approaches, thus leaving out the rich interactions and organisational processes that form the basis of MS formation. Consequently, there are no clearly articulated alternative models of the MS process available in literature, which marks a significant disparity compared to the advancements evident in the broader area of strategy process research. This situation has contributed to the slow progress and penetration of the MS concept within the industry.

However, a few recent studies have marked a movement away from this long–standing tradition. Collectively, these empirical studies have asserted that the many ways in which operations/manufacturing strategies are formed in practice are neither accurately captured nor adequately explained by the rational planning models alone. They have also provided useful insights into MS/OS formation processes, highlighting the pluralistic nature of successful strategies pursued by organisations and have explored the influence of several internal and external contextual factors on MS/OS processes. However, they have fallen short of articulating a comprehensive alternative framework or model of MS formation. As such, the literature review has established the need for explicating deeper structures of MS formation, particularly, based on empirical data, to augment the limited understanding provided by the existing rational planning frameworks. As a first step in that direction, this literature review has synthesised the currently available knowledge of MS in the form of a conceptual framework. This framework represents the key elements of the MS process within its broader context, initial parameters of interest and some tentative relationships between those elements. As such, it has helped to develop this study in several important ways which will be further discussed throughout this thesis.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1. Introduction

Manufacturing Strategy (MS), over the last few decades, has become a topic of increasing significance and interest to the Operations Management (OM) scholarly community. However, among the key reasons for its slow progress and penetration in the industry has been a lack of cohesive theory building efforts (Meredith, 1993; Swamidass, 1991; Westbrook, 1994; Amundson, 1998). The methodological traditions in the area of MS are firmly rooted in the OM discipline with little cross–referencing to other related and more mature areas of business strategy and strategic decision–making (Barnes, 2001; Rytter *et al*., 2005). This limited exposure has not only exacerbated the paucity of "cohesive" theory building, but also has contributed to a lack of "relevant, reliable and valid" models of OS (Rytter *et al*., 2005; Slack *et al*., 2004). This situation is underpinned by a scientific envy prevalent within the OM discipline. On the one hand, with its roots in such areas as management science, operations research and industrial engineering, OM has traditionally been seen as a technique–based specialisation. On the other hand, because OM is viewed as an applied field, OM scholars have been under pressure to produce knowledge that can be readily used by practitioners (Hill *et al*., 1999; Slack *et al*., 2004; Smith and Robey, 1973). The cumulative response to these demands, notwithstanding the complexity and diversity of the research issues confronted, has resulted in a research tradition of quantitative modelling, simulation and statistical analysis at the expense of developing a strong theoretical base (Hill *et al*., 1999; Meredith, 1993; Smith and Robey, 1973; Westbrook, 1995). Consequently, despite many quantitative techniques and mathematical models available within the OM field which have been useful in the analysis, development and control of the physical aspects of operations systems, it lacks theories capable of explaining emerging and more complex socio–technical phenomena that comprise technical, human and organisational variables (Bertrand and Fransoo, 2002; Filippini, 1997; Handfield and Melnyk, 1998; Meredith, 1993).

The overall objective of this research study is to advance the understanding of one such socio–technical phenomenon – the MS formation in practice. To this end, it

undertakes to examine strategic manufacturing decision–making and action–taking and to explain any consistent patterns within and across the case companies studied – that is to contribute towards theory building as opposed to theory validation and theory extension/refinement. Notwithstanding the merits of such an ambitious undertaking, it is acknowledged upfront that there is a major methodological challenge to be met. For example, Barnes (2001) noted:

> developing a deeper understanding of the operations strategy process in practice remains a task that requires further attention from researchers, whatever their motivations. It is also a task that represents a considerable methodological challenge, as there is a dearth of exemplar studies in the published literature. …even to adequately describe the complexities of operations strategy process in practice requires considerable detail. To go beyond that, to begin to offer some level of understanding must surely place even greater demands on those responsible for data gathering (pp. 1078–79).

However, an observation made earlier by Chase (1980) that "we cannot avoid some high–risk [in terms of analytical rigour] research if we are to capture the critical characteristics, which are contained in the management component of the operations management field" (p. 13) appears to have not been heeded by many OS researchers. While recognising these concerns, this study asserts that the following requirements are fundamental to demonstrating a credible research effort (Kiridena and Fitzgerald, 2007):

– appreciating the philosophical underpinnings of research and articulating the research framework that informed the study;

– taking a holistic approach to research design (informed by philosophical foundations, research issues and other constraints such as resources, time and access to data) that may include challenging traditional approaches and stepping out of the comfort zone of the researcher; and

– providing a detailed account of the methodological approach used, including the tools, procedures and techniques employed, in order to explicate the connection between the research questions, the data and the findings.

This chapter demonstrates, in part, an attempt to proactively deal with those challenges and addresses two key methodological issues; justifying the methodological approach employed and articulating the research design and procedures followed.

The first section on methodology begins with a brief introduction to the alternative research paradigms with a view to demonstrating the importance of understanding research frameworks. It then goes through the process of selecting the methodological approach appropriate for this study and provides justifications for the same. The second section lays out, in detail, the research journey, articulating its key phases – research design, data collection and analysis and the presentation of findings. This approach elicits the holistic nature and the innovative character of the research effort and the overall methodological approach taken in this study.

3.2. Understanding Research Frameworks

The well–known objective of disciplined inquiry, or scholarly research, is to contribute to knowledge and understanding of world phenomena. This is usually achieved by way of answering one or more of the natural language questions of what, who, when, where, how, why, should, could and would (Wacker, 1998). These questions typically represent various phases of the research process, including description, exploration, explanation and validation (Handfield and Melnyk, 1998; Meredith *et al*., 1989; Snow and Thomas, 1994). The cumulative knowledge produced by research is best organised in the form of theory, which usually includes an explanatory statement about an object, an event, a phenomenon, a behaviour and so forth, with some predictive capacity. Theories themselves are perceived in a number of different ways depending on the level of abstraction and the precision they provide, which include frameworks, models, tautologies, laws, and generalisations (Little, 1992). Besides theory building, there are other functions of research such as fact–finding, classification and the measurement of existing knowledge (Amundson, 1998; Peshkin, 1993; Wacker, 1998). For example, Amundson (1998) claimed that "the notion of description is an important basic knowledge–generating concept and categorising phenomena is a valid and important scientific endeavour" (p. 343). What make theory different to the outcome of other forms of scientific activity are its explanatory power and the predictive capacity.

Theory development is a dynamic, cumulative and often an iterative process. Without exploration and description it is near impossible to gather the rich information and data required for building theories with explanatory power. Moreover, theory development is time and context–bound, meaning that the process does not cease once theories have been developed, but will continue to be refined, retested, and refuted as the knowledge and understanding of the phenomena advance. As such, explorations, descriptions, explanations, validations and refinements can all be placed on a spiral of analytical progression towards theory development (Meredith, 1993; Peshkin, 1993).

Methodology, in its broadest form, refers to a way of thinking about and studying world phenomena (Strauss and Corbin, 1990). It often prescribes the preferred methods containing procedures and techniques for collecting, analysing and interpreting data. From an inductive theory building perspective, the key role of methodology is to facilitate the inquiry or the research process by assisting the researcher in transforming empirical observations into meaningful generalisations (Handfield and Melnyk, 1998). Historically, alternative research methodologies have been guided by different research paradigms, each of which was supported by a particular philosophy.

Paradigms, or worldviews, have been characterised by their ontological, epistemological and methodological underpinnings (Creswell, 1998; Guba, 1990; Morgan and Smircich, 1980). Alternative paradigms may also abide by certain ethical norms and value propositions (axiological) and their own language traditions (rhetorical). Guba (1990) posited them as basic belief systems that are shaped by the way their proponents respond to the following questions and, therefore, they cannot be challenged in any fundamental sense (p. 18):

– Ontological: What is the nature of the "knowable"? or What is the nature of reality?

– Epistemological: What is the nature of the relationship between the knower (the inquirer) and the known (or knowable)?

– Methodological: How should the inquirer go about finding out knowledge?

While some authors argue that this paradigmatic differentiation is difficult to achieve and sometimes unhelpful (Howe, 1992; Rolfe, 2006), researchers are still expected to acknowledge their philosophical stand and/or the research paradigm that informed a study (Easterby-Smith *et al*., 1991; Gephart, 2004). This expectation stems from the view that a researcher's philosophical position guides the design, as well as the choice and use of methodology and, therefore, that position should be used (in principle) to evaluate the merits (or otherwise) of research outcomes. While it is beyond the scope of this thesis to discuss in detail the alternative research paradigms they are briefly outlined in order to facilitate the discussion on the research approach used in the study.

Notwithstanding their variations, realism/positivism, interpretivism/constructivism and critical theory/existentialism have been portrayed in methodology literature as the three key alternative paradigms of broadest scope (Neuman, 2003; Guba, 1990; Meredith, *et al*., 1989). These three paradigms have been interpreted and adapted across disciplines depicting varying levels of abstraction, and have been supplemented by the emergence of pragmatism, a philosophical stance that has been embraced by a number of applied fields such as education, health and nursing studies and management (Cassell, *et al*., 2006; Hope and Waterman, 2003; Johnson and Onwuegbuzie, 2004; Ormerod, 2006).

The implications of the above philosophical positions for research are summarised below. Within the positivist school of thought, the ultimate purpose of research is scientific explanation; that is, to discover and document universal laws of behaviour or phenomena. The reason for adopting this school of thought is to learn about the world so that people can predict and control events. However, for interpretative researchers, who largely engage in social science research, the goal of research is to develop an understanding of the social world and discover how people construct meaning in natural settings. By comparison, the holistic goal of critical theory researchers is to change the world. They conduct research to critique and transform social relations and do this by revealing the underlying sources of social relations and empowering people (Neuman, 2003). According to pragmatism, theories, developed collectively and cumulatively through experience, guide actions and should be judged primarily based on the outcomes of those actions (Ormerod, 2006).

3.2.1. The Choice of Methodology

The choice of research methodology, to a large degree, is driven by the nature of the research problem, the aim of the study, the type of research question(s) and the state of knowledge in the selected area of study. The choice may also be influenced by economic and technical considerations and constraints such as time and resources availability, access to data and the desired level of analysis.

This study focuses mainly on how and why type questions (Yin, 2003; Bacharach, 1989; Wacker, 1998) associated with the phenomena being studied, that would best fit in to the mapping and relationship building phases of the theory development process (Wallace, 1971). It encompasses both the exploratory and explanatory elements of research while at the same time reflecting on the reality of dealing with dynamic, uncertain and context–dependent nature of the phenomena. Such issues as cognitive and behavioural aspects as well as the influence of contextual factors make the strategy process so complex and dynamic that there could well be more than one perspective from which the observed relationships and outcomes can be explained. This leads to the issue of fitting appropriate methodology for the type of research question(s).

A number of alternative methodologies used in the OM and other similar/related areas were reviewed and assessed against the requirements of this research study along the dimensions outlined above, with particular emphasis on ensuring the credibility of the overall research effort. Both quantitative and qualitative approaches that have been used in OM and strategy research in general and MS research in particular were examined so as to determine the most appropriate methodology in addressing the research questions at hand. There were also a number of constraints that needed to be taken into account – the study needed to be completed within a specific time frame, the project was not sponsored (i.e. self–funded) and therefore had to be undertaken within strict resource constraints, and access to data had to be negotiated between the researcher and the participating organisations on a case–by–case basis. As such, the procedure followed in choosing the grounded theory–case study approach used in this study along with the justifications for that choice is reported in some detail in the remainder of this section.

3.2.2. The Status of Qualitative and Quantitative Research in OM

For a long period, OM topics such as aggregate planning, inventory control, materials requirement planning and production/operations scheduling have been examined using quantitative modelling and simulation (Bertrand and Fransoo, 2002; Chase, 1980; Meredith and Amoako-Gyamph, 1990; Meredith *et al.*, 1989). However, such positivist methods may not be appropriate in all OM research (Beach *et al.*, 2001; Swamidass, 1991). Most quantitative decision models, for instance, rely on a variety of assumptions, including the presence of a closed–loop system, an idealised decision–maker and rational choice (Beach *et al.*, 2001; Swamidass, 1991).

In experiments, another form of quantitative method, the object of study is typically isolated from its context for the purpose of controlling for variables that are not subject to observation though it may not always be possible to control all extraneous variables. Experiments under controlled laboratory conditions are rare in OM research, but quasi–experiments such as field simulations and focus groups have been cited in some OM literature (Flynn *et al.*, 1990; Meredith, *et al.*, 1989; Snow and Thomas, 1994).

The other widely used method of the suite of quantitative approaches in OM research is the survey. Over the last decade or so, survey research has been extensively used in the emerging areas of OM, such as OS, quality management, logistics management, technology management and process design (Forza, 2002; Malhotra and Grover, 1998; Meredith, 1998). Survey research uses data usually gathered through questionnaires or structured interviews to draw statistically generalisable relationships among a few selected variables representing a phenomenon. The primary source of data is individuals representing a social unit like an organisation or a work group. Surveys have often been used in confirmatory hypothesis–testing research, though their relevance in exploratory and descriptive research is not excluded (Flynn *et al.*, 1990).

Of the many qualitative approaches, those reported in published OM research include case and field studies and, to a much lesser extent, action research and grounded theory studies (Amoako-Gyampah and Meredith, 1989; Flynn *et al.*, 1990; Leonard and McAdam, 2001; McAdam and McCormack, 2001; Scudder and Hill, 1998). The

research instruments used with these approaches include interviews, archive analysis, observations and participation, all of which can be undertaken in a variety of formats.

Qualitative research is diverse, and often incorporates a variety of data collection and analysis methods. The traditional definition of qualitative research has been based on the distinction between non–numerical versus numerical data collection and analysis techniques. However, contemporary interpretations refer to a deeper, sophisticated and more encompassing family of methodologies. Citing a number of publications, Cassell and colleagues (2006) have attributed the difficulties in defining qualitative research to four key issues: the range of approaches that are classified under the title of qualitative research; the multiplicity of epistemological positions adopted by qualitative researchers; the diversity of disciplines that use qualitative research; and the variety of forms and uses that can be seen across different geographical regions.

However, apart from the type of data used and reporting methods, many scholars in the field agree that the genre of qualitative research shares a number of characteristics: its methodological tradition and naturalistic inquiry; its mainly inductive and interpretive approach in understanding the meanings of socially constructed phenomena; and the active role and/or involvement of the researcher in the research process (Creswell, 1998; Neuman, 2003; Strauss and Corbin, 1990; Van Maanen, 1998). These features clearly set apart qualitative research from its quantitative counterpart, though they are not dichotomous as has been portrayed by some authors. Either approach may be more useful than the other in handling a particular research issue depending on the aim of the study and the circumstances under which a particular study is conducted.

The contribution of qualitative research toward generating hypotheses and building plausible theories grounded in empirical data has been hailed by many authors within the OM discipline (Meredith and Samson, 2002; Voss *et al*., 2002; Flynn *et al*., 1990). Although challenging and less efficient than quantitative approaches, qualitative research is highly effective when investigating new or emerging topics where deduced hypotheses barely resemble reality (Yin, 2003; Eisenhardt, 1989). Therefore, there is a great potential in qualitative approaches for assisting OM researchers in studying the emerging soft issues in the field.

Qualitative research demands skill, dedication and time. The rich insights gained through the extensive and comprehensive collection and the inductive, iterative and in–depth analysis of data are the key dividends of such deliberations. These explorations and insights invariably lead to the construction of causal structures underlying cognitive behaviour and social phenomena that form the basis of theory building. Moreover, the understandings or meanings of phenomena in qualitative inquiry are developed in their natural settings, an aspect that upholds their plausibility. However, a misconception shared by the proponents of positivism is that valid theories can only come through a deductive route. As a consequence, the OM community too has tended to view qualitative research as less esteemed than quantitative research (Beach *et al*., 2001; Flynn *et al*., 1990). While the inductive and deductive approaches have a long history as the foundations of scientific inquiry (Wallace, 1971), the somewhat artificial divide between the two appears to have affected the progress of the OM field.

Despite their widespread use, the suite of quantitative approaches used in OM research displays three major weaknesses. The first is the validity of assumptions upon which the design and findings are based, particularly given the complex and multivariate nature of the issues investigated in OM. The second is their focus on a few narrowly–defined variables that has implications on the applicability of findings. The third is what is known as context–stripping where a phenomenon is studied in isolation of its context – this raises questions about the causal relationships among variables. These issues are particularly relevant when the focus is theory building. They become critical when investigating managerial decision–making and people–related issues, as such phenomena cannot be meaningfully studied in isolation of the organisational and social settings in which they occur.

While qualitative traditions attend to some of these concerns, they also suffer from a barrage of difficulties associated with demonstrating their credibility. In addition, they operate within the constraints of access to data, researcher skills, time and other resources. There are also a number of factors that indirectly inhibit the progress of qualitative research, particularly, when qualitative methods are used in disciplines such as OM where positivism has traditionally ruled. These include the limitations imposed

by editorial requirements, the evaluation criteria used in the review of manuscripts and the disposition of reviewers/examiners towards particular methodological paradigms.

Based on the review of research methodology literature and considering the research issues discussed earlier, four approaches that represent both qualitative and quantitative traditions were short–listed as appropriate for further review. Quantitative approaches such as mathematical modelling and controlled experimentation were dropped out in the preliminary stage of screening, as they found to be far less capable of addressing the type of research questions involved (Rytter *et al*., 2005). Qualitative approaches such as ethnography and phenomenology were overlooked because their focus in past research has been limited to social and cultural perspectives (Baker *et al*., 1992; Grbich, 2002). These two approaches have been popular among social science researchers in studying people's experiences within cultural and social contexts.

Out of the four short–listed approaches, the case study and grounded theory were identified as preferred candidates over questionnaire survey and action research. The survey technique was excluded mainly because it could not meet the required depth of analysis envisaged in this study (Barnes, 2001; Rytter *et al*., 2005; Stuart *et al*., 2002) while action research (though deemed appropriate for addressing the type of research questions used and the level of analysis required in this study) was discarded, mainly due to the limitations of time/resources and access to data/participation.

A number of researchers have strongly supported the use of the case study approach in investigating the MS process related aspects, especially in theory building contexts (Barnes, 2001; McCutcheon and Meredith, 1993; Voss *et al*., 2002). Despite its popularity in the social sciences domain, grounded theory approach has not earned wide recognition as a methodology of its own in OM. There have also been little or no applications of action research except for some interesting discussions on the suitability of this approach, especially to studying the "soft" issues of OM (Coughlan and Coghlan, 2002; Westbrook, 1994).

The merits and limitations of case study and grounded theory approaches are studied and evaluated in more detail in the following section.

3.2.3. Case Studies as a Qualitative Theory Building Approach

The case study approach has held a prominent place within OM compared to other qualitative traditions such as ethnography and phenomenology. Lenard-Barton (1990) has described the case study as an account of a past or current phenomenon, usually drawn from multiple sources of evidence – be they primary or secondary sources. Yin (2003) has defined it as an empirical inquiry into a contemporary phenomenon within its real life context, while Stake (1995) has emphasised the notion of case as a "bounded system" (p. 2, 47). Other writers concur with these sentiments, recognising the case study to have an exploratory capacity, to be grounded in data and to be an intensive, in–depth, phenomena–based inquiry in natural settings (Creswell, 1998; Luck *et al*., 2006; Bergen and While, 2000; Meredith, 1998). Collectively, these attributes make the case study approach a serious contender when researching emerging topics in OM towards theory building against the more rational, abstract, restricted and detached approaches such as quantitative modelling, simulations and questionnaires. For instance, Meredith (1998) has claimed that "the natural emphasis of the case study approach on understanding is clearly most directly focused on theory building" (p. 445).

Although narratives of theoretical insights gained through in–depth analysis of one or two cases have been cited as the essence of the "classical" approach (Dyer and Wilkins, 1991), later theory–building research tended to have used multiple–case studies employing more structured methods with emphasis on such aspects as theoretical frameworks, replication and pattern recognition (Eisenhardt, 1989, 1991; Voss *et al*., 2002; Yin, 2003). For example, Cepeda and Martin (2005) have asserted that a sound case study should have three main elements: the conceptual framework; the research cycle; and the literature–based scrutiny of developed theory (p. 857).

However, case studies are not without their limitations. They have been reported in multiple forms and multiple types with multiple levels and methods of data collection and analysis (Eisenhardt, 1989; Yin, 1994). As is the case with many qualitative approaches, criticism has also been based on related aspects of "scientific" research such as limited generalisability and individual bias or what Silverman (2001) called the

problem of "anecdotalism" (p. 222). Moreover, there are some specific issues relating to the way case study approach has been used in OM research.

The terms "case study" and "case" are interchangeably used in a variety of forms and contexts; there is the instructional case used in the classroom, the case used in the investigation of crime, the case in law, medicine and psychiatry, as well as the case study in research. Although it is not difficult to discern case study research from its other uses, this has bred some confusion among some researchers (Eisenhardt, 1989). For example, in the editorial of a recent issue of the International Journal of Production & Operations Management, Webster and Taylor (2005) have commented that "too few authors understand the difference between a case study written for teaching purposes and a research–based case that makes an original and novel contribution" (p.1163). Another related issue is a lack of detail and specificity around the philosophical position adopted, methods of data analysis and the procedures used in the interpretation of findings, which is an important part of the evaluation criteria used by scholarly journals (Cassell, 2006; Gephart, 2004). For example, in a review of empirical research in OM involving 477 journal articles, Scudder and Hill (1998) have revealed that nearly 80 per cent of the articles that used the case study approach had not specified their methods of data analysis. Furthermore, there are numerous other reasons for choosing qualitative over quantitative (or vice–versa) approaches. These reasons include the aim of the research – whether it is theory–building or theory–validating, the current level of understanding of the phenomenon being studied and the researcher's allegiance to a particular research paradigm. However, seldom are these acknowledged in OM research.

The above situation stems, in part, from a lack of clarity regarding the philosophical foundations that inform case study research (Cepeda and Martin, 2005). Although qualitative research in social science is usually informed by the interpretivist school of thought, many OM researchers using the case study approach appear to have adopted a positivist stance in their analysis and the interpretation of data.

3.2.4. Grounded Theory Studies as a Qualitative Theory Building Approach

Grounded theory (Glaser and Strauss, 1967; Strauss and Corbin, 1990) is perhaps the most clearly articulated qualitative research approach located within the social sciences domain. However, since its inception (Glaser and Strauss, 1967), the approach has evolved considerably. Currently there are two widely acknowledged versions (Glaserian and Straussarian) that are effectively treated as two different methods (Glaser, 1992; Goulding, 1998; Strauss and Corbin, 1990) often forcing those who use them to specifically identify the preferred version.

The grounded theory approach is often identified with its characteristic coding technique that progressively transforms qualitative data into meaningful explanatory frameworks though the two versions place different emphases on the coding procedures. This iterative process of data analysis typically involves three levels of coding that progressively aggregate the data up "the ladder of analytical abstraction" (Carney, 1990) by way of identifying categories (open/descriptive coding), themes (axial/inferential coding) and conceptual schemas (selective/pattern coding and modelling) from mainly text–based data and observations. The higher order conceptual and/or explanatory frameworks are then enfolded in extant literature to make meaning of them by way of comparing, contextualising and explaining the emerging theoretical gestalts (Miles and Huberman, 1994). Within the grounded theory approach, theory is interpreted as a set of relationships that offers a plausible explanation of the phenomena under study (Strauss and Corbin, 1994: 21–24). Theory developed this way is considered to be firmly grounded in empirical data – "arising out of data and are supported by data" compared to those developed using deductive approaches (Goulding, 1998; Gibbs, 2002: p. 165).

As such, the essence of the grounded theory approach is "making sense of the data collected [preferably, through multiple sources] and giving them a structure [by reorganising them conceptually] with a view to determining their meaning and significance for the actors, the researchers and readers" (Parker and Roffey, 1997: p. 214). Driving this process is a set of guiding principles consisting of theoretical sampling, simultaneous data collection and analysis, constant comparison, progressive

reflection and category saturation that clearly illustrate the desired balance between the iterative, value–laden character and the methodological rigour of the approach.

Despite the differences in the methodological emphasis reflected in the original vs. later definitions provided by the two authors, presented below, comments by other authors imply that the epistemological positions held by the two versions are not as divergent as the authors themselves assert (Goulding, 1998; Parker and Roffey, 1997).

> Systematic discovery of theory from the data of social research (Glaser and Strauss, 1967: p. 2–3).

> A qualitative research method that uses a systematic set of procedures to develop and inductively derive grounded theory about a phenomenon (Strauss and Corbin, 1990: p. 24).

> A general methodology of analysis linked with data collection that uses a systematically applied set of methods to generate an inductive theory about a substantive area (Glaser, 1992: p. 16).

The key differences arising out of the divergent views of the co–founders (i.e. Strauss vs. Glaser), as critiqued in literature, can be synthesised as follows:

– a–priori understanding/formulation of the research issues/questions vs. entering the field with no preconceptions about the phenomenon;

– a specific/structured procedure vs. general guidelines in data analysis; and

– theory/concept development and provisional validation through iterative coding, comparison and explanation vs. focusing on theory building only (leaving validation to subsequent studies, preferably quantitative).

Perhaps, because of its apparent prescriptive emphasis, the approach is perceived by some scholars as linked to the positivist tradition. However, the proponents of grounded theory, while asserting that the approach is clearly located within the interpretivist school, have discounted the above notion as a misconception or ill–informed adoption (Goulding, 1998; Parker and Roffey, 1997).

Despite its strengths, grounded theory approach has not been able to escape scrutiny. The approach is criticised for being quasi–positivist, its rigid/prescriptive methods and for the idealistic and potentially conflicting goals (Grbich, 2002; Selden, 2005). Other potential pitfalls such as forced coding, premature closure (leaving the field too early and under–analysis of textual/narrative data), methodological transgression (frank violation of the tenets of grounded theory approach) and generational erosion (undermining the original tenets) have also been attributed by Goulding (1998) and Wilson and Hutchinson (1996).

This study acknowledges its preference towards the latter version (Strauss and Corbin, 1990) while appreciating, in principle, the value of a more structured approach, particularly, in investigating a phenomenon such as MS which impacts on and is influenced by the human, social, organisational and technical aspects of socio–technical systems. Thus, it incorporates a conceptual framework, the three–step coding procedure and a focus on theory building (as opposed to theory validation).

3.2.5. Grounded Theory–Case Studies as a Combined Qualitative Approach

Natural sciences involve the study of physical and material aspects of the world and have traditionally been based on positivism. In contrast, social sciences focus on studying human aspects of the world, their behaviours, norms, interactions, institutions and cultures (Neuman, 2003), and have found value in qualitative research (Flynn *et al.*, 1990). OM manifests as a "mongrel mix" of physical and human aspects pertaining to the socio–technical systems (Drejer *et al*., 2000; Schmenner and Swink, 1998).

Thus, investigating contemporary topics in OM, such as MS/OS, demands innovative approaches that challenge the methodological traditions inherited from the positivist school. For instance, Leong and colleagues (1990) emphasised that MS researchers must be willing to invest in finding and learning new methods of analysis. This is also justified based on the level of detail required in the analysis and the complexities involved in researching such phenomena. Additionally, theory–building research in these areas requires in–depth analysis of empirical data because the knowledge–base has not sufficiently developed to be able to use hypothetic–deductive approaches. The

technical, human and organisational variables of operations systems cannot be meaningfully studied using quantitative approaches alone. In studying the dynamics of complex, multivariate and context–dependent problems, it is imperative that researchers explore wider methodological options (Chase, 1980; Trim and Lee, 2004).

After carefully considering the merits and limitations of both the case study and the grounded theory, the remainder of this section explores the feasibility of using a combined approach, within the constraints imposed by the study.

As discussed earlier, case study research can provide rich insights into complex phenomena leading towards understanding their deeper structures within specific contexts. The contribution of these insights, particularly in the early exploratory phase, to theory building is indispensable. However, case study research is often challenged for the reliance on retrospective accounts (internal validity), individual bias (construct validity/reliability), and the idiosyncrasy (external validity) of findings (Eisenhardt, 1989; Leonard-Barton, 1990; Meredith, 1998; Stuart *et al*., 2002; Yin, 2003). Silverman (2001) summed up many of these issues as the problem of "anecdotalism" and argued that qualitative researchers cannot exempt themselves from the standard requirements that must be met by credible scientific research. However, a growing section of the scholarly community strongly objects to applying positivist criteria in the design and evaluation of qualitative research (Cepeda and Martin, 2005; Fossey *et al*., 2002; Morgan and Smircich, 1980; Sandberg, 2005). Apart from the above key issues, case research is often criticised for its limited methodological exposition that have had wider ramifications for publication. Despite the numerous advice provided in literature, this still appears to be a significant barrier, especially, for OM researchers (Meredith, 1998; Stuart *et al*., 2002; Voss *et al*., 2002). Case studies, as mentioned before, are also criticised for their association with rival philosophical traditions.

The grounded theory approach, by comparison, has some inherent strengths that can effectively negate some of the limitations associated with the case study approach, but has been criticised mainly for its prescriptive character and other difficulties associated with the operationalisation of the methodology. For example, entering the field with no pre–conceived ideas, achieving theoretical saturation and the level of creativity and

theoretical sensitivity expected of the researcher – they are all treated as ideal goals by some authors (Grbich, 2002). However, its overall credibility is strongly guarded by its structured and rigorous process of data collection and analysis.

One way of overcoming or minimising the impact of these limitations is using mixed–methods. For instance, the longitudinal multiple–case study approach has been touted as a useful method for investigating strategy process both in strategic management and MS literature (Pettigrew 1992; Barnes, 2001, 2002). Similarly, the use of the longitudinal single site along with replicated multiple site case studies has also been found to be useful. For instance, Leonard-Barton (1990) argued that a real–time longitudinal case study can improve internal validity by strengthening causal links whereas multiple cases augment external validity and help guard against observer bias.

Mixed–methods offer opportunities to enhance the confidence (convergent validity) in the findings through triangulation (Jick, 1979). Triangulation can be operationalised at different levels and/or in different forms: data (using both qualitative and quantitative data); researcher (involving multiple investigators); and methods (between or within method–mix of instruments). Regardless of the particular mode used, the value of triangulation rests on the notion of complementarity – the strengths of one would compensate for the limitations of the other – be it corroboration, confirmation or contingency (Jack and Raturi, 2006). The aim is to establish a richer, holistic and more complete picture of the object or phenomenon that cannot be achieved with single designs (Denzin and Lincoln, 1994; Jack and Raturi, 2006; Jick, 1979).

However, on the down side, there is the possibility that mixing of alternative methods belonging to rival philosophical traditions may further complicate the research process leading to sub–optimal results unless potential issues are carefully addressed through the research design. For instance, method "slurring" or "muddling" of methods is a form of criticism aimed at indiscriminate mixing of methods in a way that compromises the integrity of each approach (Baker *et al*., 1992; Goulding, 1999; Wilson and Hutchinson, 1996). Moreover, research rigour, resources, time and research effort can be considered as dimensions that are, to some extent, traded off against each other when choosing between alternative research approaches.

The two approaches of case study and grounded theory share a number of features and characteristics between them. They are both informed by the interpretivist school, are favoured in researching emerging topics, examine phenomena in their natural settings or specific contexts and are able to provide valuable theoretical insights and contribute towards theory building (Eisenhardt, 1989; Goulding, 1998; Parker and Roffey, 1997; Stake, 1995; Yin, 2003). In this respect, they are two very compatible approaches. Despite these many similarities there are a number of differences as well.

Case studies are preferred in the exploratory stages of the theory development process with a view to developing rich insights into understudied areas whereas grounded theory studies are favoured in the mapping and relationship building phases towards generating "skeletal" theories or conceptual frameworks (Meredith, 1998; Parker and Roffey, 1997; Stuart *et al.*, 2002). Although both approaches use similar sources of data and approaches to data collection and analysis, the grounded theory method is more structured and explicit and hence has a greater capacity to demonstrate its methodological rigour (Strauss and Corbin, 1990). The findings of case study research are often presented in the form of narratives and assertions while grounded theory findings are presented in more abstract forms of propositions, conceptual models or as substantive theory (Stake, 1995; Yin, 2003). As such, careful fusing of those two approaches would provide rich descriptions of phenomena in specific settings and more substantial conceptual models or frameworks with a higher level of generalisability. This would be particularly appropriate given the nature of the two research questions used in this study (how and why). In essence, it would lead to generating plausible theory without losing the rich insights and contextual relevance. The structured method of grounded theory along with the replication logic applicable to multiple–case studies further strengthen the reliability as well as the internal and external validity of findings. Based on the above deliberations, this study decided in favour of the grounded theory–case studies, as informed by the interpretivist school of thought, for studying MS formation in practice. However, the use of mixed–methods does not guarantee better outcomes by default and there is always the possibility of overlaps, contradictions and sub–optimised outcomes. Therefore, it is prudent to be aware of the limitations and potential pitfalls of the combined approaches.

The combined grounded theory-case study approach used in this study does not incorporate a real–time longitudinal element and, therefore, is not fully equipped to conclusively establish cause–and–effect–type relationships. However, as the aim of the study is to identify the patterns in strategic decision–making and action–taking with some causal understanding (that is, to establish the causal structure underlying MS processes) the methodological approach is consistent with the objectives of the study.

The "category saturation" within the grounded theory approach aims at improving both the construct and internal validity. The replication logic in multiple–case studies does not aim at generalising the findings to populations in positivist terms. Instead, it aims at generalising to a substantive area or theoretical propositions. Thus, the two strategies aim at enhancing the credibility of the research effort, as well as the plausibility of the findings within the constraints identified earlier.

In order to maintaining the integrity of each approach, Wilson and Hutchinson (1991) have illustrated the use of two compatible qualitative approaches (grounded theory and phenomenology) within the interpretivist paradigm as two different phases of a study rather than aiming at a hybrid approach. That has meant separate data collection and analysis using different interview styles and procedures, which in effect, is equivalent to conducting two individual studies. However, such a strategy would barely demonstrate the creativity or innovation expected when mixing methods, particularly, with respect to the duplication of effort in the context of time/resource constraints confronted by many researchers.

3.3. Articulating the Research Journey

Clear and detailed exposition of the methodological approaches adopted is sparse in most publications that have used qualitative research (Cassell, 2006; Gephart, 2004; Eisenhardt, 1989). Even among the most detailed accounts of methods reported in literature, researchers have used a mishmash of approaches without paying much attention to their philosophical underpinnings. This is less of an issue in quantitative research because the techniques and instruments used are self–explanatory and there are relatively well–established conventions on what procedures to follow. For instance,

the issue of credibility in survey research is somewhat mitigated with the mention of statistical techniques. In contrast, for case study research it becomes a serious issue and methodological rigour often needs to be defended. This is no easy task, especially given the privileged methodological traditions in certain disciplines and the varying tastes and philosophical allegiances of reviewers. The crucial part of methodological disposition is clearly articulating the connection between the research questions, the data and the findings. Some qualitative approaches are better able to demonstrate this than others. A simple yet effective way of meeting this requirement is to be as specific as warranted by the context in which the research study is carried out while reporting on all procedures followed. It is also critical to articulate the philosophical foundations that guided the study, which is seriously lacking in many published OM studies.

This section aims at illustrating those protocols and procedures followed in this study. As acknowledged in the previous section, this study takes an interpretivist stance with regard to its philosophical position. That means, socio–technical phenomena such as MS formation are socially constructed, but there can still be a cohesive structure underlying those phenomena that are shaped by the individual, cognitive, social and contextual factors. Those structures and their characteristics can be revealed through studying the meanings the actors make of their behaviour and interactions, as well as the ways in which they interpret and respond to the influences of those factors.

3.3.1. Research Design and Procedures

In the context of this study, the research design encompasses deciding on the unit of analysis, the sampling plan and methods of data collection and analysis, as well as developing a research protocol. In pursuit of the most appropriate research design, a range of methodological issues were considered. In general, research efforts are judged by their ability to produce valid knowledge (Silverman, 2001: p. 221). Within the positivist paradigm, ensuring reliability, validity and analytical rigour are often cited as the fundamental requirements of a credible research effort and they are directly related to and/or influenced by the choice of methodology and research design.

Validity in general is defined as the extent to which an account accurately represents the phenomena to which it refers (Hammersley, 1990: p. 57). The three types of validity found in literature are construct validity, internal validity and external validity, which is also known as the generalisability. Yin (2003) has interpreted construct validity as establishing correct operational measures for the concepts being studied. Internal validity is interpreted as the ability to establish a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships (Yin, 2003). External validity, the extent to which the results of a study can be extrapolated to populations and other contexts, refers to establishing the domain to which a study's findings can be generalised. Reliability reflects the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions (Hammersely, 1992: p. 67). It demonstrates that the activities of a study such as the data collection procedures can be repeated with the same results on different occasions.

Given the strong opposition to applying the above positivist criteria for evaluating the credibility of qualitative research, there is growing consensus towards developing equivalent criteria. For example, while addressing validity and reliability concerns may be implicit in the research process, interpretivists heavily focus on demonstrating the parsimony and fidelity to the data (Goulding, 1998; Lincoln and Guba, 1990). "We need methods that are credible, dependable and replicable in qualitative terms" (Miles and Huberman, 1994: p. 2).

Although traditional qualitative approaches advocate the induction of theory purely from empirical evidence, more recent literature favours a–priori definition of research questions in order to help the researcher to be more focused on the type of organisations and the data to be targeted (Eisenhardt, 1989; Miles and Huberman, 1994; Yin, 2003; Voss *et al*., 2002). Eisenhardt (1989) claimed that "a–priori specification of constructs can also help to shape the initial design of theory building research" although "the research question[s] may shift during the research" (p. 536). These arguments are further supported by the assertions such as "good strategy process research is neither theorising and modelling in the abstract nor observation and recording of events in a theoretical vacuum" (Chakravarthy and Dos, 1992: p. 9) and

"the researcher, rather than commencing with a theory which he or she attempts to verify, commences with an area of study and allows relevant theoretical constructs to emerge from that process of study" (Parker and Roffey, 1997: p. 214).

This study used the conceptual framework (Figure 2.1 in Chapter 2) developed based on a comprehensive literature review to inform the research design and how to carry out the field study. Its structure was guided by the Miles and Huberman (1994) interpretation; "[it] explains, either graphically or narrative form, the main things to be studied – the key factors, constructs or variables – and the presumed relationships among them" (p. 18). Barnes (2001) asserted that such theoretical frameworks be "best developed from existing literature by building on commonly accepted concepts and models" (p. 1082).

There are no clear guidelines available for defining and operationalsing the "unit of analysis" in OS research. This is not surprising given that the issue has only been loosely treated even in the work of prominent authors (Bergen and While, 2000). Miles and Huberman (1994) defined the unit of analysis as a "phenomenon in a bounded context" and described it using some examples; "an individual or a small group of people in a defined context, or an organisation, or a social unit such as a community or a settlement, or even an entire nation …events/episodes, processes or a physically or geographically defined entity" (p. 26). Individual decision maker, the top management team, business unit of a firm and the global corporation, they all have been used as the unit of analysis in strategic management research (Snow and Thomas, 1994). In this study, the unit of analysis is strategic "decision–making and action–taking" which is a unit (phenomenon) smaller than the case unit – the overall MS formation process. MS process is viewed as consistent patterns emerging out of those decision–making and action–taking which may include both formal and informal mechanisms. As such, actors, events, procedures, routines, structures, practices, responses, relationships, culture, politics and leadership style are all parameters of interest.

The rationale behind the determination of the appropriate number of cases is often raised as an issue when using the case study approach. By comparison, this is less of an issue in grounded theory studies because they are driven by the "open case"

concept. It is widely agreed that findings in qualitative research are generalised to theoretical propositions and not to populations or universes (Firestone, 1993; Leonard-Barton, 1990; Silverman, 2001; Yin 2003). Therefore, replication logic has been the preferred approach employed in analytic (Eisenhardt, 1989; Yin, 2003) and theoretic (Meredith, 1998) generalisations pursued in qualitative research compared to statistical (Eisenhardt, 1989; Yin, 2003) and assumptive (Meredith, 1998) generalisations used in quantitative approaches. Eisenhardt (1989, 1991), Yin (2003) and Barnes (2001) have all dealt with this issue from varying perspectives and the general agreement arising out of those discussions is that, as a rule of thumb, the number of cases in a multiple–case study could be between four and ten depending on the research issues and the state of knowledge on the phenomena being studied. The number of cases in this study was set to be between six and ten with the expectation that it would be adequate to explain predictable similarities (replication principle) and any variations for discernible reasons (refutation principle) that could be observed across cases.

The sampling technique employed in this study is both purposive (as required by the case study approach) and theoretical (as required by the grounded theory approach). Theoretical sampling allows data reduction from the outset of the planning process whereas purposive sampling helps control certain parameters of interest through the judicious (purposive) selection of cases and, therefore, supports replication. Informed by the conceptual framework, nine organisations were selected considering, especially, the context dependent nature of the MS process in order to support the replication logic aimed at analytic and theoretic generalisations. For instance, the size of the organisation and the stage of firm development (maturity) were two key internal contextual factors presumed to be related to the rationality of strategy formation. That meant the cases were selected to include organisations of different sizes, mainly based on the number of employees and annual turnover/revenue levels (grouped as of large, medium, small and micro), as well as of different maturity levels (embryonic, consolidating, established, pioneering). The firms were also selected based on the type of manufacturing processes (representing batch/assembly phases as against the job shop and continuous production) they employed. Meredith (1998) noted that the handling of the factors of interest is an important point to be addressed at the design stage of a research study in order to draw accurate conclusions from the data. He

emphasised that correctly identifying the right number of factors and assigning those factors into the right categories (i.e. parameters and variables) will greatly enhance the ability to draw accurate conclusions (p. 446).

The selection of suitable case companies was perhaps the most daunting task of the whole project. Selecting companies to satisfy the requirements of the study and getting those preferred companies to agree to participate was truly a challenge, given the high degree of time commitments expected from the part of the participating firm. Over 200 companies were approached mainly using email and phone contacts the details of which were publicly available. Preliminary discussions were held with appropriate senior management staff of more than 30 companies, based on a brief outline of the project. These discussions led to the identification and matching of the interests of both parties, and in reaching a mutual agreement to continue to (or not to) participate in the project. Eventually, nine suitable organisations were chosen to take part in the study. All nine cases were chosen to represent the metal products manufacturing (Subdivision 27) and machinery and equipment manufacturing (Subdivision 28) of the 1993 Australian and New Zealand Standard Industrial Classification (ANSZIC) Division C, manufacturing sector. As such, they represented a fairly homogeneous sample in terms of the manufacturing processes employed. Guidelines for conducting interviews, managing data and using computer software for the analysis of data were set out in the field study protocol. Ethics requirements were also spelled out in the field study protocol – outlining the procedure for conducting field studies and the management of data – a copy of which is provided in Appendix 2.

3.3.2. Data Collection and Analysis

In qualitative studies, data can come from varying sources: interviews; observations; and document/archive analysis. Data collection (the choice of data and sources) is often guided by the research questions and the initial conceptual framework developed in the early phases of a study. The analysis of qualitative, and often text–based, data is, therefore, about dissecting (dividing) and re-organising (combining/linking) data gathered though multiple sources towards building meaningful conceptual schema in a way that leads to drawing valid conclusions about phenomena. The single most

important issue related to the data collection and analysis is how well the researcher can demonstrate the connection between the research questions and the data gathered in the field (Kiridena and Fitzgerald, 2007). The mechanism employed in this study to achieve this objective is the structured coding process advocated within the grounded theory approach. Therefore, providing adequate details on how patterns were derived from the data is crucial in enhancing the credibility of research findings.
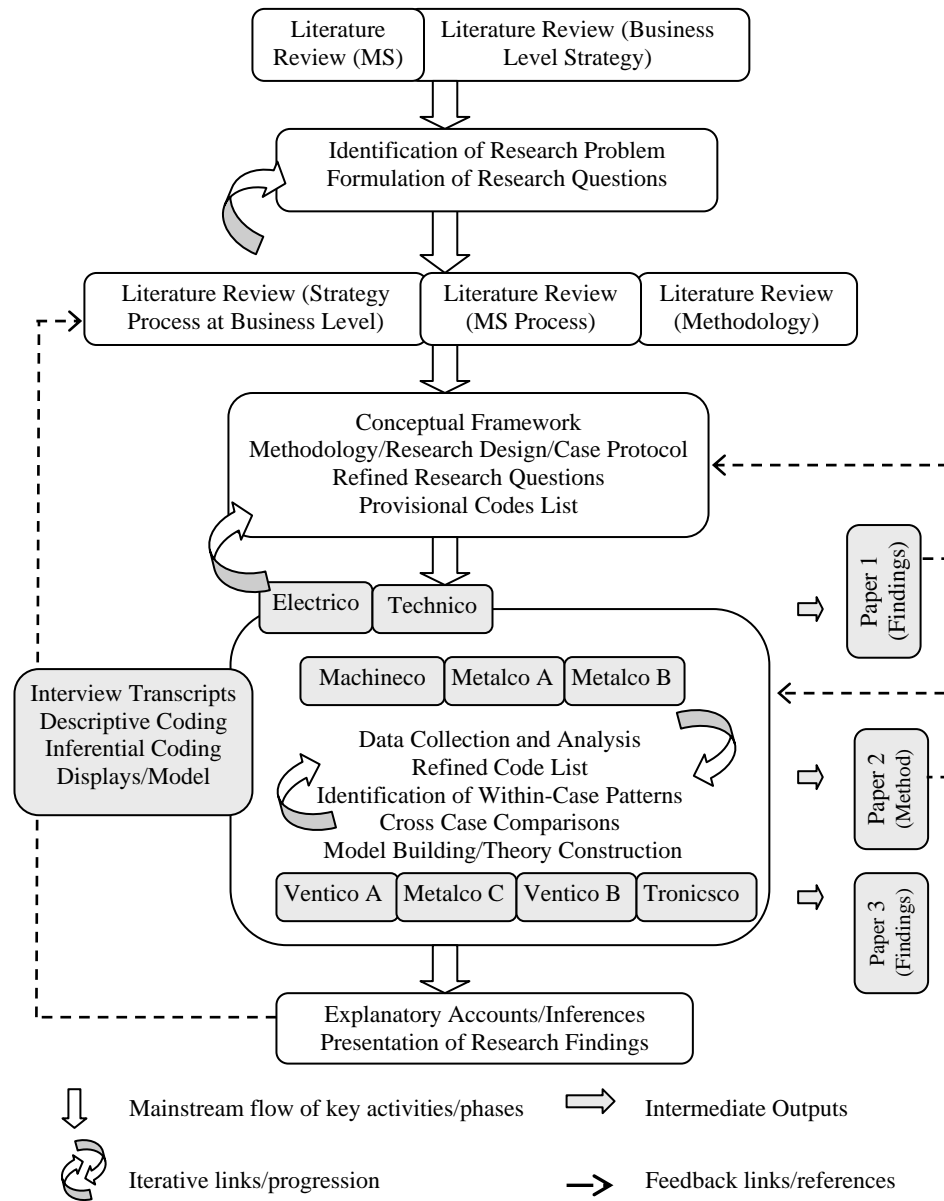
Figure 3.1: Methodological Approach Used in the Data Collection and Analysis

The approach shown in Figure 3.1 is used in the collection, analysis and interpretation of qualitative data. It was largely informed by the work of Miles and Huberman (1994) and supplemented by the contributions of a number of other authors (Eisenhardt, 1989;

Barnes, 2001; Voss *et al.*, 2002; Yin, 2003). Starting with the conceptual framework and research questions, a comprehensive research protocol consisting of research instruments, an interview guide and sample interview questions was prepared in order to facilitate the data collection and analysis.

As illustrated in Figure 3.1, the nine cases were dealt with in three stages that involved blocks of two, three and four organisations. This not only helped refine the research instrument and the iterative collection and analysis of data, but also was helpful in managing the workload involved in the collection and analysis of a large amount of data. For instance, at the time of negotiating with the second group of companies, the collection and analysis of data from the first group of companies were well in progress. Therefore, it was possible to utilise the exposure gained through dealing with the first two companies and the emerging findings, to refine interview questions, negotiating access to appropriate data and even in selecting the remaining case companies from a shortlist of those who had already agreed to participate. As such, the early stages of the first two cases effectively served as pilot studies while the later studies were helpful in refining the research instrument and in the progressive collection and analysis of data. However, apart from some circumstantial factors, there was no particular rationale behind the grouping or ordering of cases in the sequence given in Figure 3.1.

The principal method of data collection was semi-structured interviews (Kvale, 1996; Seidman, 1998) drawing participants from different functional areas and layers (from senior management to supervisory level) of the organisation hierarchy and was backed up by direct observation of the operations systems and a limited archive/document analysis. Interviews were conducted with senior management staff representing manufacturing, marketing, human resources, as well as engineering, inventory and procurement areas. For each case company, up to three rounds of interviews, each of 45–90 minutes duration, were conducted in an iterative fashion usually over a period of two to four months. All interviews, where allowed, were recorded and transcribed into text. A range of company documents, both published and unpublished, was used to supplement the data gathered through interviews. The main purpose of using multiple sources of data was triangulation while iterative interviews ensured the depth of analysis and the opportunity to further clarify issues.

Transcription of interviews by the researcher only, as per the conditions agreed upon within the requirements for the ethics approval, made the task much more time consuming than expected, but greatly enhanced the consistency of the study. A start (provisional) list of codes mainly at the descriptive–level was identified based on the conceptual framework, and it was later modified, refined and extended to include emerging new categories during and after data collection. In the data analysis, initial descriptive codes were used to organise and retrieve data categories while inferential codes and the more abstract conceptual schemas and other data displays were used in the interpretation of the data and causal understanding of across–case patterns. Three different types of data displays, namely matrices (Miles and Huberman, 1994), process maps (Darlow and Baines, 2000) and causal networks (Miles and Huberman, 1994) were developed mainly based on the inferential and pattern codes identified. As indicated by curved block arrows and dashed line arrows in Figure 3.1, the iterative process of data collection and analysis consisted of progressive coding and constant comparison of data within and across the nine cases, as well as against the conceptual framework and the findings of previous studies. Furthermore, the feedback received through publications and presentation of preliminary findings to scholarly audiences was also useful in further refining the research instrument and conducting later case studies. These intermediate outputs are indicated by dashed arrows in Figure 3.1.

Literature is rich in prescriptive guidelines on research design, methodological options and conducting field research in general, but operational details on how to handle field data and draw valid meanings out of those qualitative data are sparse. As noted earlier, a detailed account of how inferences were made out of the field data was considered fundamental to enhancing the credibility of research findings. The data displays used in this study along with the other method–related descriptions provided in the two chapters that follow help serve this purpose. Although using the qualitative data analysis software "NVivo" did not provide credibility by default (as is usually the case with the statistical analysis) it introduced the much needed discipline such as record keeping which added to the reliability of the research effort. It also enhanced the efficiency of handling the large amount of qualitative data without losing its richness.

3.3.3. Presentation of Findings

Key elements of the presentation of research findings are developing the compositional structure of the report and identifying and connecting to the appropriate audience (Yin, 2003; Miles and Huberman, 1994). Ways and means of addressing the broader research issues such as contribution to knowledge and originality of that contribution are also needed to be reported appropriately. However, answering the question of how meanings could be derived from qualitative data remains the central point in many qualitative research reports. Miles and Huberman (1994) recommended thirteen specific tactics to be followed in ensuring that meanings derived from data are valid and repeatable. Apart from following the common set of conventions in reporting research outcomes, qualitative researchers need to provide an account of the methodology used and procedures followed in the collection, analysis and interpretation of data. In this regard, compared to the support available to the quantitative researchers, qualitative researchers lack a widely agreed set of conventions to follow. A number of authors have advocated that this problem can be partly overcome by providing a detailed account of what was done, how it was done and how conclusions were drawn from the data gathered.

Literature lists at least three major categories of audiences for a research report: the fellow researchers; users of research outcomes such as policy makers and practitioners; and other specialist interest groups such as dissertation committees and those who sponsor specific research projects. As each group has different backgrounds, interests and preferences, addressing the report to the right audience is considered to be critical to the overall success of a research project. Yin (2003) stressed that although the research procedures and methodology should have followed strict guidelines, the report itself should reflect emphases, detail, compositional form and even a length suitable to the needs of the potential audience. For example, the emphasis, format and style of the interim case reports submitted to some participants in this study were substantially different to those of this thesis prepared for examination. The progress reports submitted to the review panels needed to be yet another version different from the above reports.

OM is well known for its foundations in the positivist paradigm. A major part of presenting the research findings to those who come from quantitative backgrounds is demonstrating the research rigour and the contributions to knowledge and, therefore, in some instances it is helpful to draw analogies from quantitative studies.

Because the study began with a conceptual framework there is potential for a general misunderstanding among the audience that the aim of the research exercise is to empirically test that framework as in the case with many quantitative (theory validation) studies. Within the context of qualitative theory building research, the conceptual model serves two major purposes. It is the first step in theorising. Based on the existing knowledge of the phenomena, the researcher identifies the key parameters of interest and other factors that might have an influence, including any tentative relationships among those factors and the parameters of interest. Building on that crude conceptual framework, the researcher can then structure the study (e.g. determine unit of analysis, select sample cases and decide what data should be collected) towards answering such questions as what is happening, how is it happening and why is it happening that way. Typically, the results are presented in the form of propositions, tentative hypotheses, or more abstract conceptual schemas and models explaining the phenomena subject to study, including any underlying patterns and/or structures. This study endeavoured to follow these guidelines to the best possible extent.

3.4. Chapter Summary

This chapter dealt with a number of strategic (choices), tactical (design/protocols) and operational (procedures/detailed accounts) methodological issues confronted by OM researchers engaged in theory building research in general and MS process research in particular. First, it emphasised the importance of understanding research frameworks with a brief introduction to alternative research paradigms. This was followed by a discussion of the issues related to the choice of appropriate methodologies. It also presented a case for justifying the use of grounded theory–case studies as the preferred approach to investigate complex socio–technical phenomena such as MS formation. Second, it dealt with the key issues related to meeting the requirements of a sound theory building research effort such as addressing the problem of anecdotalism,

demonstrating the scholarship of research and contributing to knowledge. Third, an important operational issue of connecting the data and the findings/conclusions to the research questions were discussed in some detail. The problem of anecdotalism could be best dealt with through the choice of appropriate methodology and research design. Scholarship of research can be enhanced through inclusion of (and following) suitable protocols in research design and providing adequate details on data collection and analysis. Contribution to knowledge could be demonstrated through publication of findings to appropriate audiences addressing their needs.

Despite the significant support and reputation it has earned so far as a credible research methodology, the challenges a researcher may face in applying and defending a qualitative method in OM theory building research remain significant. In the context of the novice researchers, the single most important factor is to devise appropriate strategies, tactics, compositional structures and other defends in order to address the problem of anecdotalism. What the audience expects in general is to ascertain for themselves the credibility of the research effort. That is, mainly, to know how data were collected and on what basis their interpretation came from. Perhaps the best possible way to meet this challenge, given the practical constraints (such as handling of large amounts of qualitative data) associated with qualitative studies, would be to be as specific as warranted by the context in which the research project was carried out and reporting all procedures followed and the protocols used. An integral part of this approach was to maintain a database in addition to the various case study reports that might have been produced along the way. However, this has to be fought against a general lack of appetite among the positivists for lengthy descriptive narratives, which they consider less plausible (and less scientific) compared to statistical summaries and mathematical models.

CHAPTER 4: WITHIN–CASE DATA ANALYSIS AND FINDINGS

4.1. Introduction

This chapter constructs within–case patterns of strategic decision–making and action–taking for all nine case companies studied. Case narratives for each company are presented using a uniform structure in order to facilitate and demonstrate the application of constant comparison, progressive reflection and category saturation, which are considered to be the three pillars of qualitative data analysis. The overall approach to data analysis is guided by the analytic progression recommended by Carney (1990), shown in Figure 4.1. The narratives presented in this chapter are also intended to serve as a supplement to Chapter 3 as they provide further details of the procedures used in the collection, analysis and display of text–based data.

The variations in the level of detail provided across cases reflects the differences in the nature and size of the firms studied, the number of participants interviewed in each case, the extent of interviews and the level of detail extracted from each interview, as well as the number of documents analysed in each case. It was also partly affected by the nature of the study (for example, the type of data required) and the inherent limitations of qualitative research such as access to data, resource constraints and the participants' lack of willingness to reveal commercially sensitive information. However, this research study has been designed to minimise the impact of such limitations on its findings. For example, consistent with the research questions, the unit of analysis was chosen as "decision–making and action–taking processes" as opposed to individual "decisions and actions". This allowed category saturation to be pursued at the organisational process–level thereby mitigating the impact of any bias at the single interview and individual participant–levels. The effects of these deliberate measures are reflected in the findings of this study. For instance, the within–case patterns of strategic decision–making and action–taking presented in this chapter reflect a level of analytical abstraction that is more detailed than that of the currently available MS models, but they are less specific than what has been provided in the micro–level strategic decision–making models. Therefore, this approach demonstrates a credible research effort that aimed at achieving a high level of analytical rigour and relevance.

3. Developing and testing propositions to
   construct an explanatory framework

3b

Delineating the
deeper structure

Synthesis: integrating the data
into one explanatory framework

Testing hypothesis and
reducing the bulk of the
data for analysis of
trends in it

3a

Cross-checking tentative findings
Matrix analysis of major themes in
data

2. Repackaging and aggregating the
   data

Identifying themes
and trends in the
data overall

Searching for relationships in the data:
writing analytical memos
Finding out where the emphasis and gaps
in the data are

1. Summarising and
   packaging the data

Trying out coding
categories to find a set
that fits

1b

Coding of Data
Writing of analytical notes on linkages to
various frameworks of interpretation

Creating a text to
work on

Reconstruction of interview tapes as written notes
Synopsis of individual interviews

1a

Figure 4.1: The Ladder of Analytical Abstraction (Source: Carney, 1990: p. 92)

95

4.2. Electrico

Electrico is the most comprehensive case study undertaken in this study. Interviews were conducted with ten supervisory to senior management staff representing manufacturing, marketing, human resources, engineering, procurement and quality management areas. Up to three rounds of interviews, each up to 90 minutes duration, were conducted in an iterative fashion over a period of five to six months. Most of the interviews were recorded and transcribed into text. In addition, a wide range of company documents, both published and unpublished, were used as source material.

4.2.1. Company Background

Electrico is a divisional subsidiary of a large multinational industrial manufacturer with multiple business groups and annual revenue exceeding $10 billion. The company manufactures a range of electrical equipment and components mainly for the Australian market. With a number of acquisitions over the past several years, the parent company has undergone significant transformation, aimed at building a globally integrated business. This transformation has had a direct impact on the operations of this strategic business unit (SBU), which itself has recently acquired another company.

The SBU serves the industrial and commercial markets in Australia with its overall strategic direction set to move down the value chain (forward integration) towards providing turnkey solutions within its major product/service lines. It competes against other major manufacturers of both local and overseas origin that market reputed brands, based on uniquely defined customer service and quality dimensions with a long–term focus on improving delivery performance. However, Electrico's "make or buy" decisions are largely influenced by its parent company and business group's strategies which are driven by product costs and local market requirements. As such, a significant share of its product portfolio is sourced from overseas plants based on their ability to fulfil the needs of the local market and cost competitiveness.

Electrico has a functionally organised hierarchical structure with matrix type external reporting to the group and parent company management. Over the past several years, it

has undergone major re–structuring with extensive staff redundancies and significant changes at all levels of management. Over this period, the parent company has been implementing a number of programs aimed at aligning the case company's core values, policies and business processes with those of the parent company.

Manufacturing processes are mainly of assembled–to–order and engineered–to–order type with only a few finished products being made–to–stock. The plant has recently embraced the lean manufacturing/six sigma philosophy and has been able to reduce delivery cycle times in all product categories on an ongoing basis. A number of other improvement initiatives aimed at addressing people, technology and business process issues have also been pursued with varying degrees of success.

4.2.2. Data Analysis and Display (Case Narrative)

Electrico has a well–articulated SBU–level strategy including a clear framework for strategy development. This was evidenced through both the interviews conducted with the senior management and the analysis of the company's internal documents. The documented strategic plan consisted of a strategy statement that included strategic initiatives, major programs, a profit plan and key performance indicators (KPI) in the form of a balanced score card for the business unit.

The documents analysed stated a number of key inputs such as market needs, parent company expectations, stakeholder interests and local needs as drivers of the strategy process. Determining the impact of these input factors on the business led to the development of a strategic statement, an annual profit plan and the KPIs for the SBU. The strategic statement and annual profit plan along with other drivers relevant to each function were then used as inputs to the process of developing action plans, objectives and performance measures for each function. These initiatives were then allocated to each supervisory and technical staff as individual objectives with links to the performance management system (PMS). However, the senior management was still responsible for achieving functional–level objectives which were allocated to them in the form of aggregate measures.

The documented version of the overall strategic planning process is schematically represented in Figure 4.2 below. The temporal dimension of this process was recorded as an annual roll–out (period) with a five–year horizon which was somewhat inconsistent with the one–year and three–year horizons claimed by the participants.
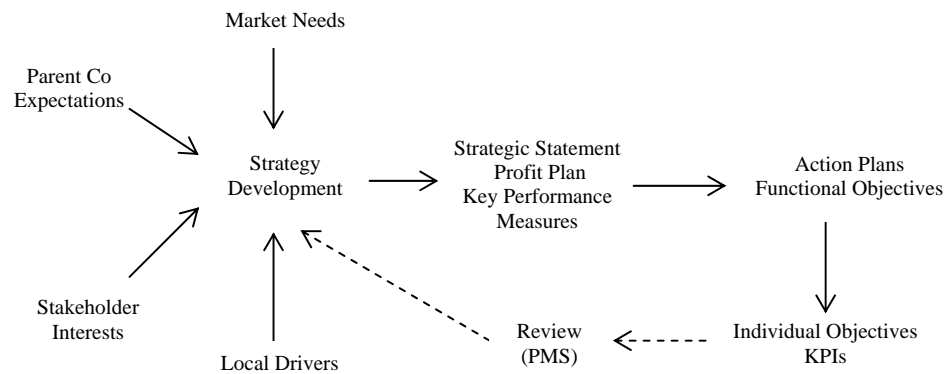
Figure 4.2: Overall Strategic Planning Process for Electrico (documented)

Although the actual mechanism of strategy development had not been elaborated in the documents, the interviews conducted with senior management revealed that it was a judgmental process rather than an analytical one. Despite well–articulated steps in the documented process, the strategic choices made were not found to be based on the comprehensive analysis of quantitative data or information.

The overall strategy process was driven by the General Manager (GM) with inputs from senior management in charge of such functions as marketing and manufacturing. With the GM having to represent the interests of the parent company, group/divisional units and shareholders, his role in the overall process was seen to be the most influential. The marketing/sales function also played a significant role in the strategic planning process through its contribution towards the product–market decisions and the development of the annual profit plan. According to one participant, this was achieved through addressing such questions as "what markets to serve?", "what products to sell?" and "what do we want to achieve?" towards determining overall markets, customer groups and ways and means of "attacking" each customer base.

Interviews conducted with the participants from the marketing/sales area confirmed the strong influence of the senior marketing/sales management in shaping the overall strategy of the business unit, but no further details were revealed as to how this was done. However, it was observed that the strategic marketing decision process was fairly comprehensive as illustrated in Figure 4.3 below.

Number of quotations won and lost
Direct customer feedback
Surveys, independent audits

Strategic Direction
(Grow as a manufacturing business)
Marketing Direction
(How to develop capabilities to offer differentiated products

Analyse current competitive position in each product-market segment
Strengths ~ biggest markets with greatest opportunities + highest discretion
Weaknesses ~ areas for improvement/capabilities
Determine things to do to enhance competitive position

A set of Activities Plan

Allocate to Individuals

Individual Objectives

Trend analysis of what we do against what competitors do

Figure 4.3: Strategic Marketing Decision Process for Electrico (interviews**)**

In contrast, manufacturing's contribution to developing SBU–level strategy seemed to be minimal, for example, as reflected in the following statement by one participant:

> This is mainly done through our GM and sales and marketing people with the other members of the senior executive sort of being involved but not as such. They only sit and watch what's going on and advise, but its really driven at the top end by the GM and sales and marketing.

This assertion showed connotations of the thinking of the manufacturing management reflected in the following interpretation of MS offered by one participant:

> My interpretation of manufacturing strategy is structuring the major elements of manufacturing in such a way that it supports the other activities of the business which are primarily sales and marketing.

Interviews conducted with a number of managers (a sample of which is given below) further corroborated these observations and implicit causal links.

I suppose, overall, the start of the process is sales strategy because that sort of strategy is done by the GM and probably sales. They decide which products they're going to put up and which products they want to sell.

From that sales strategy which we then blow down into manufacturing – what do we need to be able to do to support that sales strategy in the market? So, we need manufacturing capability, we need workforce, skilled personnel to be able to make those products, we need to buy parts.

The elements of manufacturing as elaborated by the Manufacturing Manager and other participants consisted of manufacturing's ability to support products and delivery related performance and such aspects as staff organisation and development, inventory levels and cost structure. The strategic manufacturing decision process as embedded in the overall strategic planning process, established through the analysis of documents, can be summarised as shown in Figure 4.4 below.

Strategic Plan
Profit Plan
Other Drivers
Balanced Score Card

Identify Drivers for Change in Mfg.
Analyse Situation for Drivers
Analyse Other Functions' Impact
Develop Action Plans for Mfg.

Mfg. Action Plans,
Objectives &
Performance
Measures

Allocate to
Individuals

Individual
Objectives
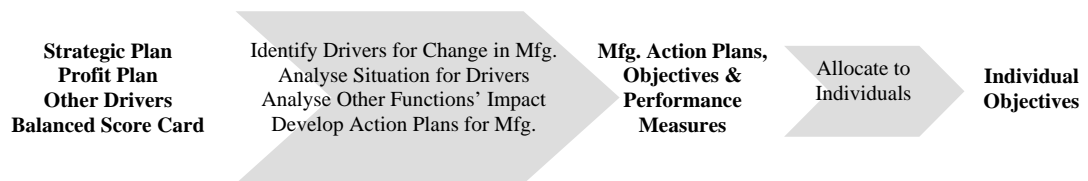
Figure 4.4: Strategic Manufacturing Decision Process for Electrico (documented)

However, a detailed analysis of the transcripts of more than fourteen interviews conducted with the supervisory to senior management staff across a number of areas revealed that the strategic manufacturing decision process at Electrico was far more complex, iterative and comprehensive than what was recorded in the documents.

As acknowledged by one participant in the following statement, there was no explicit MS in the documented form.

We don't really have an individual acceptable manufacturing strategy. We have an overall scope of strategy.

Instead, the MS process was embedded in the overall SBU–level strategy process. A key element of the manufacturing decision process was identifying the drivers for

change in manufacturing based on the strategic plan, the annual profit plan and other local drivers. The strategic plan included a number of initiatives; those derived from the key inputs mentioned previously as well as from such major programs as safety, lean manufacturing and ISO certification introduced by the parent company.

The Manufacturing Manager, who first analysed and assessed the impact of these drivers on manufacturing, then developed a set of action plans for manufacturing which were further disaggregated into individual objectives to be allocated to key technical and supervisory staff. These individual objectives which were also linked to the PMS were realised through a series of individual decisions and actions.

The key manufacturing action plans identified based on the strategic initiatives, major programs and the elements of profit plan included those aimed at improving quality and customer service performance (warranty claims, fill rate, on–time delivery), six sigma projects (green/black belt), a major safety program and a large number of measures for reducing costs. Despite this emphasis on cost reductions that cut across all activities of the organisation at all levels, price was not formally recognised as a basis for competition in the SBU–level strategy. Instead, cost savings appeared as part of the profit plan and were formally recognised as profit drivers.

Nonetheless, the overall process of manufacturing decision–making and action–taking established based on the interviews conducted with the Manufacturing Manager was broadly consistent with what was recorded in the strategy documents.

The key elements of the process were captured in the interviews conducted with the Manufacturing Manager as shown in the following excerpts:

> As far as inputs are concerned – inputs to the process – the inputs are mainly the strategic plan of the company, the overall marketing plan for the company and then there is a whole heap of requirements – I call them drivers – for the development of people, for training needs and hours, inventory levels, yes, there is a whole heap of things like that, which are driven in the strategic planning and feeding to MS, they are the inputs.

I take through that year's strategic plan – or I have actually involved in formulating the strategic plan – feeding from marketing and sales on an annual basis and from that, and we do some analysis of what we think we should be doing, through GM, and we negotiate, discuss, modify and eventually sign–off.

So, we take the strategic plan, we take the next year's profit plan, looking over drivers of, say, manufacturing got to be moving in this direction – from that a number of initiatives or actions are developed that need to be done in manufacturing. Out of that, initiatives and directions are set up as objectives for the manufacturing group. Then, from those objectives – we call it the performance management system – we set objectives with the key technical and supervisory staff within manufacturing …the main process from that down to the supervisory level is through the performance management process where we annually set up with each individual their objectives for the year ahead.

The overall process of strategic manufacturing decision–making and action–taking reconstructed based on both the documents analysed and the interviews conducted with the senior management is shown in Figure 4.5.

However, as elicited through the interviews with the staff representing both the sub–departments within manufacturing and the other functions, there were numerous other initiatives that ended up as manufacturing–related action plans. They stemmed from such diverse requirements as addressing internal problems (for example, absenteeism, low employee morale and IR issues), responding to ongoing competitive pressure (for example, price, quality and delivery) or regulatory compliance (for example, safety and environmental issues) and assimilation of ad–hoc initiatives as directed by the headquarters (e.g. employee survey, business excellence and corporate values).

Other Drivers
Parent Co Directives
Divisional & Group Drivers

Marketing/Sales Mgmt.
Marketing's Goals
Market Needs (+guess work)

Market Performance

General Mgmt.
Shareholders Interests
GM's insights
(interpretation/judgement)
Corporate Values

Strategic Directions
Product-market Strategy
Quality and
Customer Service Goals
(Competitive Priorities)
Annual Profit Plan

Strategic Initiatives
Major Programs
Profit Drivers

Mfg. Action Plans
Mfg. Objectives
Performance Measures

Individual Objectives
Performance Measures
Decisions & Actions

Discuss, modify
and sign-off

Negotiate, discuss,
modify and sign-off

Manufacturing Mgmt.
Make-or Buy decisions
(assessment)

Mfg. Performance
—[Capabilities]

Main driving force/causal link

Secondary force/influence (double arrow-interactive)

Performance feedback

Iterative/two way links

Figure 4.5: Strategic Manufacturing Decision Process for Electrico (based on documents and senior management inputs**)**

103

Further details of the strategic manufacturing decision/action process, including the roles played by sub–departments, were revealed through the interviews conducted with a number of supervisory and technical staff. For instance, a number of directives received from the headquarters management, often at short notice, advised them to undertake numerous strategically significant initiatives such as those aimed at business excellence certification and in embracing corporate values. The following excerpt taken from an interview conducted with one middle manager highlights this situation.

> I just get an email from someone over there, usually a manager who I've never met, don't know, never spoken to, and they just inform me this is what we need to do …a lot of what they're trying to implement, it doesn't really work in this country …the first initiative, it was obviously driven by headquarters, so I had to organise that, and half the time I'm not given any warning as to why we're doing and what feedback I am going to get and, to be honest, even our GM doesn't know what this is done for.

In addition, there were numerous other initiatives which emerged from within the functional areas that were not related to the primary inputs identified as driving the strategy process. For example, the following information revealed by one middle manager captured a major initiative added to the list of manufacturing action plans in order to address some ongoing problems within manufacturing (which was not revealed in the interviews conducted with the Manufacturing Manager).

> We had a committee running this year, under the direction of GM and that addressed some issues, particularly, absenteeism, and came up with ways to reduce it… Our absenteeism rates are just really very high.

The interviews with the supervisory and technical staff provided further insights into the individual decisions and actions that formed part of the PMS through which strategy is realised. As indicated by some participants (cited below), individual actions and decisions were driven, to a larger extent, by the performance objectives per se with little or no regard to their long–term strategic implications.

> I had goals to reduce everything in the assembly time by forty per cent because it's in my objectives. We need to get about quickly. …the

management doesn't really care where we're up to. They just want the product out, they don't really worry about how or what it would affect, it just got to go out of the door. …so, to help your individual objectives you basically do it yourself, or you fail.

There is a bit of a strategy in regard to this type of work, that's predominantly at the sales and marketing end, but we're at the lower end, not at the market, but at the lower end of the project scale. …we have the ability to do all those; to package those along with the main product, which at the moment we can do some of them, not all of them, and whether we're going to move in that direction, we still haven't got a firm response to that. …we've been told yes, we want to be there, but we haven't been told exactly how we're going to get there.

The actors involved in the process and their roles were also elicited through the interviews. Mainly, the Manufacturing Manager was the key individual who played the central role in developing and driving the MS process. GM was the next most influential individual with marketing also playing a significant role, particularly, in foreshadowing the future capability and capacity requirements. Individuals in charge of sub–departments and other functions also had a more facilitative type role in the process while supervisory staff within manufacturing played a major role in strategy realisation, mainly through their individual actions and decisions. Initiatives that were of major scale often drew other sub–departments' and functions' support as part of their implementation.

The temporal aspects of the overall decision process were observed to vary across the range of initiatives and action plans depending on such aspects as the urgency, complexity, scale and the source of initiation. A more complete data display reflecting the details of the process of MS formation, identified as above, is presented in the following data display (Figure 4.6).

Safety Program
Lean Manufacturing
ISO Certification

Parent Co Directives
Divisional & Group Drivers

Competitor Behaviour
(Real-time changes in product-market conditions)

Shifting Goals of Cost,
Delivery and Quality

Marketing/Sales Mgmt.
Marketing's Goals
Market Needs
(analysis/judgment/guess work)

**Market
Performance**

What markets to serve?
What products to sell?

Analyse; Assess; React

Supervisory/
Technical staff

General Mgmt.
Shareholders Interests
GM's insights
Corporate Values
(interpretation/judgment)

Participate; Advise;
Influence

Strategic Directions
Product-market Strategy
Quality and
Customer Service Goals
Annual Profit Plan

Strategic Initiatives
Major Programs
Profit Drivers

Mfg. Action Plans
Mfg. Objectives
Performance Measures

Individual Objectives
Performance Measures
Decisions & Actions

ROI
expectations

What we can/not do?
How can we do (better)?

KPIs (BSC)

Discuss, modify
and sign-off

Negotiate, discuss,
modify and sign-off

Analyse; Assess; Adapt

Manufacturing Mgmt.
Make-or Buy decisions
Improvement Needs
(analysis/assessment)

Mfg. Performance
[Capabilities]

**Other Functions and
Sub Dept.'s Initiatives**

Parent Co Directives (Ad-hoc)
Internal Problems
Regulatory Compliance

Staff training
Inventory levels
Absenteeism
Safety

→ **Main driving force/causal link**

→ **Secondary force/influence (double arrow: two-way influence)**

---> **Performance feedback**

<---> **Iteration/Interaction**

Figure 4.6: Strategic (Manufacturing) Decision Process for Electrico (based on all evidence)

106

4.2.3. Summary of Electrico Findings

Electrico possessed a clearly–articulated and well–documented SBU–level strategic plan incorporating business, marketing, and manufacturing perspectives with direct links to its operational activities and performance measures. The documented strategy displayed hierarchical neatness and broad causal links. The planning/review period associated with the strategy process was one year with a horizon of varying lengths as perceived by functional level managers against what was recorded in the company documents. SBU strategy was reviewed/revised each year with major inputs from the GM, marketing/sales, parent company and limited involvement of/contributions from other functions. Marketing's dominance in the process was evident with the GM playing a pivotal role. The influence of corporate and group authorities was found to be widespread, and tensions between corporate and local initiatives were observed to have undermined the consistency and the coherence of the overall strategy process.

The generic competitive strategy of Electrico was "differentiation through customer service and quality". Although the terminology used was somewhat in variance with what is commonly accepted in the MS literature, customer service in this context stood for delivery related performance such as delivery dependability (on time delivery) and product availability (stock fill rate). With regard to quality, the company was complying with specifications/standards which they call industry norms and, therefore, could be treated as an order qualifying characteristic of the products. An exception to this interpretation was the case of some products competing based on their technical capabilities. The company also emphasised cost savings across all operational activities though price was not explicitly recognised as a competitive priority.

Based on the strategic plan, profit plan and marketing's goals, the Manufacturing Manager established the overall direction in which manufacturing should move in order to support the strategic plan. Objectives, key initiatives, actions and performance measures were then developed for the manufacturing function. Although MS was not explicitly recognised, there was a clear process through which key manufacturing decisions and actions were driven at the upper end of the company hierarchy.

The Manufacturing Manager identified drivers for change relevant to manufacturing and then a situation analysis was undertaken to ascertain the sub departments' impact on these drivers taking the current status of manufacturing into account. Initiatives with measurable objectives were then developed for the manufacturing group. This exercise led to the determination of various actions required to overcome a set of problems or to initiate necessary improvements within manufacturing in order to achieve the stated goals in the annual profit plan. Apart from the initiatives identified through the above process a number of other initiatives were observed to have included in the manufacturing's action plans. These additional initiatives emerged through a number of sources such as directives from the headquarters, ad–hoc responses to competitor moves (current or imminent) and operational problems which did not have direct links to the formally identified drivers of strategy.

Once the action plans for the whole manufacturing function were finalised, they were assigned (either as is or after further breaking down into more specific tasks) to individual supervisory and technical staff. Initiatives, objectives and performance measures were then set for each individual (through negotiation) so that the progress could be tracked and reviewed against those objectives, ideally, on a regular basis. However, what specific decisions and actions an individual should undertake in order to achieve those objectives were left to be determined by the individual concerned.

Thus, the MS process was found not to have provided a clear framework for guiding lower–level operational decision making. Instead, at the implementation phase, the PMS focused on short–term results leaving the decision–making and action–taking to the lower–level supervisory staff without providing them sufficient details of the company's long–term strategic direction. This situation along with the relatively hostile and heavily unionised workforce was found to have made it difficult for the front–line managers to make decisions and take actions in congruence with the company's overall strategic direction outlined in the documented strategic plan.

However, these findings should be interpreted in perspective as the parent company has been endeavouring to implement a number of major changes addressing human, technological and business process aspects as part of its global integration efforts.

4.3. Metalco A

This case study included four interviews, each up to 90 minutes duration, conducted with four supervisory to senior management staff over a period of four months. Two interviews with the senior managers were recorded and transcribed into text whereas notes were taken during the other two interviews. In addition to the broader aspects of business and manufacturing strategies the interviews covered several strategic events and initiatives that had taken place over a period of six years. A number of internal as well as publicly available documents were also used as source material.

4.3.1. Company Background

Metalco A is an Australia–based large company comprising several strategic business units with its operations across several continents and annual turnover exceeding $8 billion. It is organised on a geographically–based and market specific structure with two levels of management at the group and business unit levels. The company serves both the industrial and commercial markets in building construction and manufacturing sectors with a wide range of products covering a significant part of the value chain. The company's structure and business strategy largely reflected the nature/diversity of its products and the differences in the needs and characteristics of regional markets. In Australia, the company's range of products and services are rivalled by a few major players and/or a number of smaller companies depending on the position occupied by different product groups in the value chain.

Similarly, given the diversity of the markets it serves and the scale of its operations, the company competes based on quality, competitive price, brand name and marketing and sales strengths, as well as a number of other criteria specific to each market segment (such as delivery, flexibility and customer service). The company's overall strategic direction is to grow in its preferred markets with a focus on expanding into the high value–added segments of the value chain, including developing regions across the world and expanding sectors within Australia. The SBU strategies are developed within this broad framework reflecting a one–year period a seven–year horizon.

Production processes employed by each SBU vary widely but could be broadly grouped into process and large batch type with extensive deployment of advanced process technology. As such, the company has been investing heavily on research and development, as well as on other major initiatives relating to process improvement and technology upgrade. These improvement projects are generally aimed at increasing efficiency, improving product quality and enhancing process flexibility.

4.3.2. Data Analysis and Display (Case Narrative)

Metalco A had a comprehensive documented framework driving its strategic initiatives at the group management level. Major initiatives such as investments in new business opportunities, facilities location and expansion, purchase of plant/equipment, process improvement and technology upgrade were all initiated at the SBU management or higher level. Although these initiatives were formally recognised by the SBU–level management as part of the company's strategic plan, some of them were ideas that had been evolving or, in some cases, been dormant for extended periods of time. The following excerpts suggest that, at times, the company had been rich with such ideas.

> So we had a real cupboard full of ideas and part of the plan was well, which [ideas] we are going to progress first.

> The first three ideas, those are the ideas that have been around since 90s, and it was basically an opportunity to release, the time was right to invest.

The initiatives identified as above were observed to have progressed within a robust project management framework where each investment proposal was subject to a rigorous peer–review process. The initiatives, presented to the review teams as business cases with supporting evidence, were evaluated and guided by a set of principles against specific criteria. These criteria particularly recognised the effort put in to a project at the early phases of its life cycle in terms of defining the project, identifying risks/uncertainties and establishing its feasibility and business value. The approach employed both quantitative analysis (historical data, forecasts etc.) and qualitative judgments (on reputation, market access etc.) to support (and evaluate) the feasibility and business value of a proposal, as reflected in the statement below:

Even if you have the numbers it's not completely objective because in any business case there are a lot of assumptions. What you assume about prices and volumes and what you would be able to do, you can have a fantastic looking return, but it might be so optimistic that it's unbelievable …it's again part of the reason in having this independent peer–review. They should cover all those things and they should test those assumptions, certainly with big projects.

This aspect of the process provided the incumbent managers with the opportunities to address potential issues confronted with their initiatives and refine the proposals before they proceeded to the approval stage, as reflected in the following excerpts:

It's all part of a plan where you are trying to go and what will happen within the different businesses. They will put together how we are going to realise that plan or we have to make these investments, they will work them up until they get to a stage that they are ready for approval.

You basically start with the concept which is very rough and then as you refine it there is pre–feasibility and feasibility and then approval.

Once the initiatives have gone through the peer–review process, they were presented to the appropriate level of management (SBU executive, group executive leadership team–ELT or board of directors), depending on their size and significance, (type, complexity, financial commitment and strategic importance) for approval. At this stage, the relevant decision maker(s) considered the proposal put forward by the project sponsor (incumbent manager) along with the submissions from the review panel in order to determine their merits and prioritise resource allocations.

The approved initiatives were then executed by incumbent managers by deploying internal and external resources as required. The company recognised that, despite this thorough process, there are still chances for project failure or less than expected outcomes due to issues associated with their execution. As such, the status of the projects were reported at regular intervals to the higher management in line with standard project management practice as reflected in the following excerpt:

The CEO of the SBU and then below him, a series of people are responsible for that asset. He would report back on a quarterly or more frequently if needed to the ELT. He doesn't report to any one in terms of how that's going on a day–to–day basis. The performance would be monitored by the financial people and by the CEO, by everyone.

However, the documented framework did not contain provisions for addressing potential issues during the execution phase. In fact, the company did not encourage changes to a project in the execution phase unless there was a very strong case for such change. Any changes during the execution phase (for example, due to the impact of unanticipated events) were therefore required to be approved by the authorising decision maker(s). This fell in line with the company's philosophy that the overall project value can be maximized during the concept to approval phases by identifying opportunities that fit in with the strategic direction and that have the best probability in achieving their expected outcomes. It was further assumed that expected outcomes of initiatives screened as above should (must) be deliverable.

In contrast to the above process that was applicable to major investments, the initiatives of smaller scale with narrower scope and of relatively less significance were initiated and progressed through a far less formal process within each SBU division. For instance, a number of initiatives related to incremental process improvements, workforce issues and performance improvements were initiated at the SBU department manager's level. In some occasions, operational problems and improvement opportunities were initiated by supervisory staff and were discussed with the relevant department manager. They were then presented to the divisional head for review and approval. Approved initiatives were then either implemented or actioned by the department manager with contributions from supervisory staff.

Another strategically significant decision initiated at the group ELT/CEO level did not fall within either of the above categories. The decision to review the viability of an overseas operation was spontaneously initiated with the appointment of an independent investigator (within the company) by the group CEO and the setting up of the terms of reference by the group ELT. The investigator then assembled a review team and

conducted what was called an "objective on–site review" of the operations of that business. The review, based on the inputs provided by local management and the analysis of company performance data and operational issues, developed a range of options, including the discontinuation of the manufacturing operations of that business. The evaluation of these options in terms of their economic merits and the strategic impact on the business led to a recommendation to improve and continue operations. It was also revealed that a number of operational, financial/cash flow and performance related problems/issues have culminated in the announcement of this initiative.

The key process attributes of the major initiatives studied, along with their broad timeframes are presented in the following data display (Figure 4.7).
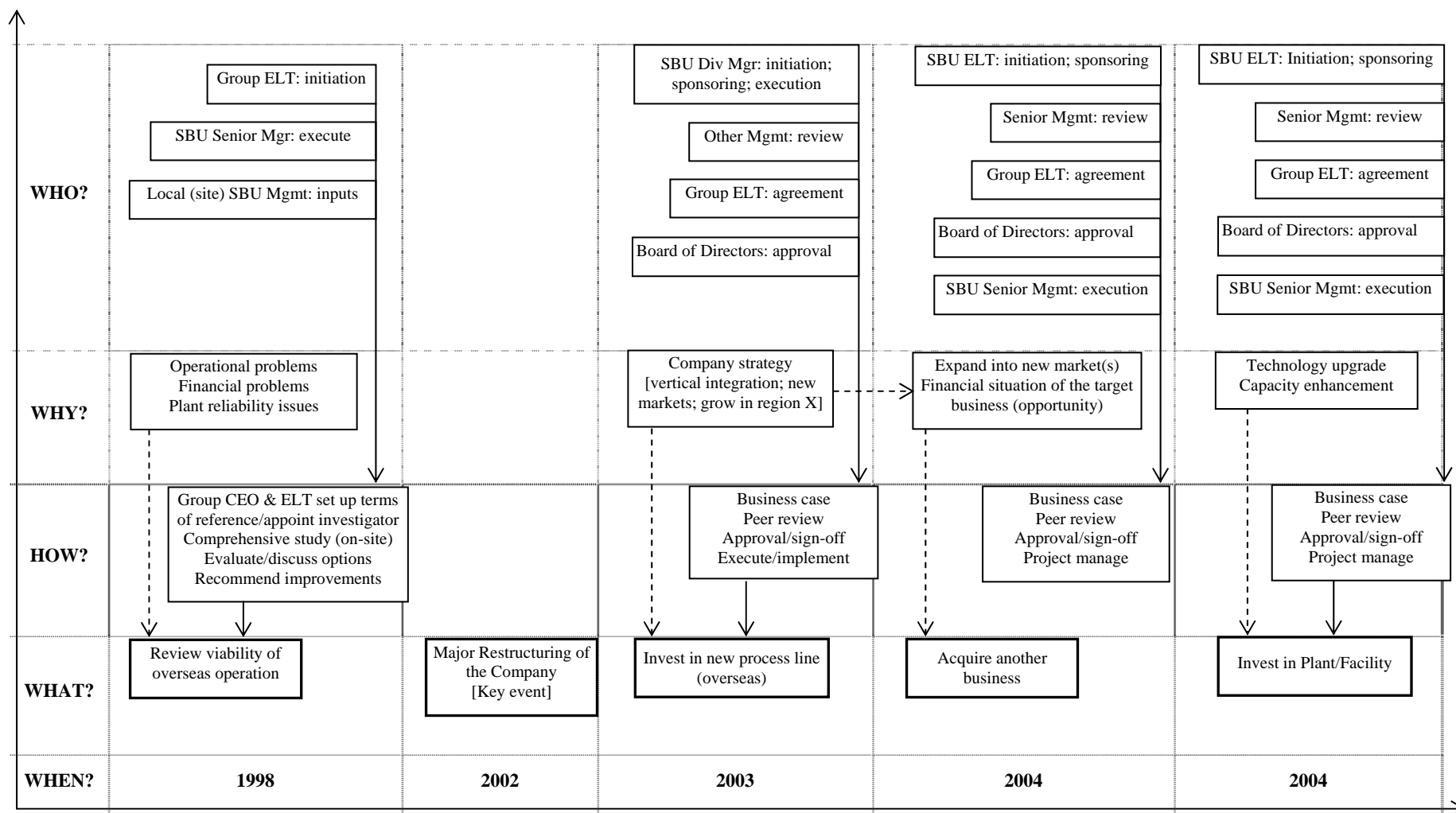
Figure 4.7: Strategy Process Map for Metalco A

114

4.3.3. Summary of Metalco A Findings

Metalco A's strategy process at the group management level was by far the most structured one with well–documented policies and procedures and evaluation processes relating to major capital investment decisions, restructuring initiatives and large–scale improvement programs etc. Major strategic initiatives were formally recognised at the group or SBU management level as part of the corporate/SBU strategic planning process and progressed through a rigorous peer–review process before they were agreed and/or approved by the relevant authority (Divisional Head; SBU ELT/CEO; Group ELT/CEO). As they progressed though the peer–review process, these initiatives were modified and refined at various stages as their merits and limitations were debated. Approved projects were then executed/implemented by sponsoring managers with internal and external resource inputs.

In contrast to the above major initiatives, small–scale strategic decisions and actions were initiated in a much less formal manner with individual management and supervisory staff identifying operational problems, workforce related issues and the opportunities for process/performance improvement. These initiatives were either consolidated into larger projects to be progressed through the above peer–review process or reviewed at the SBU department and divisional level before they were approved at the appropriate level of management depending on their size and strategic significance. The initiatives once approved were realised through implementation and/or actioning by the department–level managers with inputs from supervisors.

The overall patterns of strategy formation for Metalco A are schematically shown in the following data display (Figure 4.8).
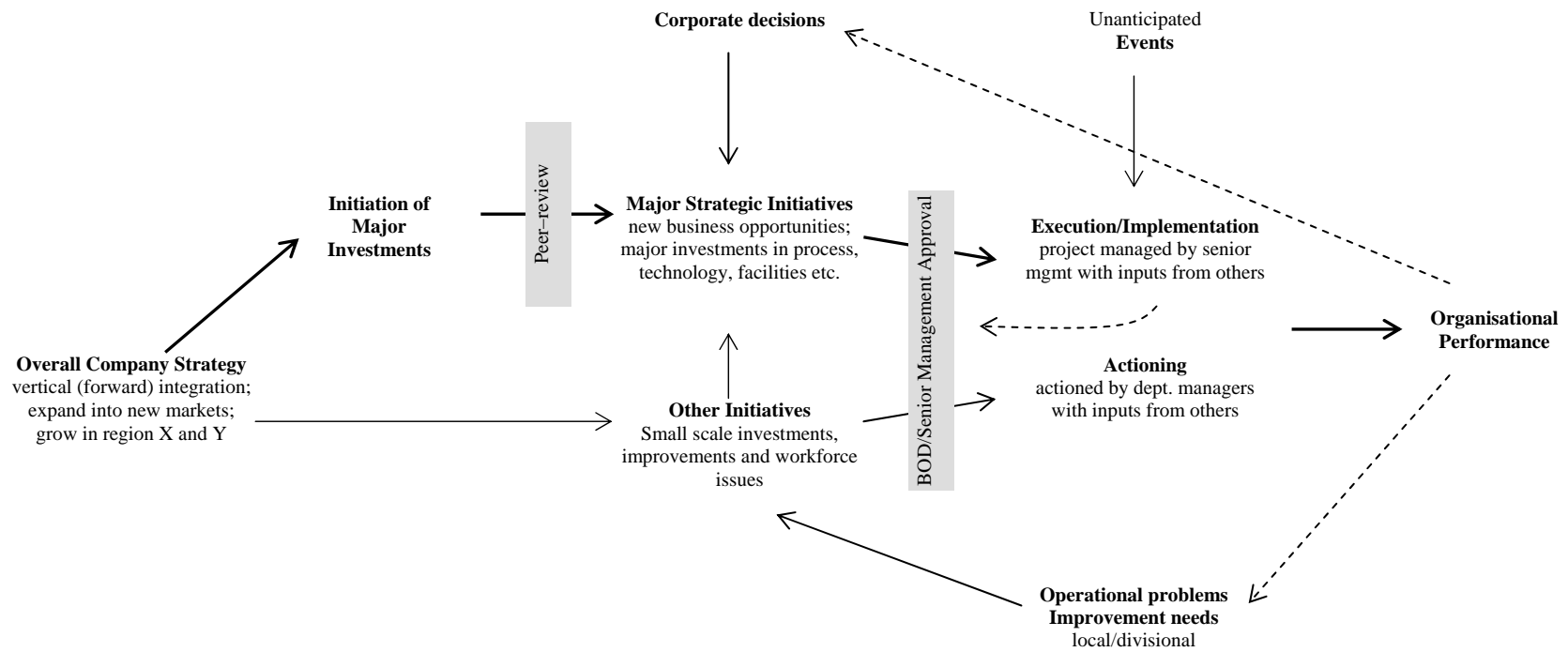
Figure 4.8: Strategic (Manufacturing) Decision Process for Metalco A

4.4. Metalco B

This case included six interviews, each up to 90 minutes duration, conducted with the Operations Manager and two supervisory staff over a period of four months. The first interview with the Operations Manager was recorded and transcribed into text whereas notes were taken during the other interviews. Apart from the general aspects of strategy, the interviews covered several major strategic manufacturing initiatives undertaken over a period of five years. The interviews conducted with the supervisory staff were used to corroborate and supplement data gathered in the interviews with the Operations Manager. A few internal documents as well as other publicly available information were also used as source material.

4.4.1. Company Background

Metalco B is a privately–owned medium–sized Australian company in the metal products (building) manufacturing sector which claims to be the market leader in that industry sector. With annual sales exceeding $120 million and over 500 staff, the company operates several manufacturing and sales sites across the country.

The company's major customers are from the local building construction sector, but it also has a growing overseas market. However, the company's current focus on overseas expansion is aimed at gaining access to new markets rather than off–shoring of its manufacturing operations. The local market is served with three different product lines. Metalco B's overall share of the local market is estimated to be more that 50 per cent, but it has a much larger share of the high–quality "prestige" segment. Some products offered by Metalco B face significant competition from Australia–based companies serving the "low–end" of the market. Its competitive strengths are considered to be the high quality of products associated with its brand name and the ability to offer customised products whereas its competitors are known for competing based on delivery time with a basic off–the–self product range. With a view to further improving its market share, Metalco B continues to shorten delivery lead times without compromising the flexibility offered through its customised product range.

The company is organised in a geographically based hierarchical structure with manufacturing facilities located across the country and a significant and growing overseas presence. The company has recently undergone a change of ownership resulting in a change of top management and it has recently acquired another smaller company that has complementary expertise in a growing segment of the company's market. The company continues to expand its markets both local and overseas.

Production processes are of small batch and assembly type with the flexibility to fulfil made–to–order and assemble–to–order requirements. Recent investments in process technology along with modifications to old equipment (incremental improvements) has provided the much needed capacity and flexibility for meeting increasing delivery expectations and demanding customer needs in a highly competitive industry.

Metalco B's organisational culture is perceived as "militant" and "entrenched" with a heavily unionised workforce. In the past, there have been major challenges for the management with initiatives involving organisational change as workers tend to view any new initiative as a potential threat to their job security and employment conditions. Such initiatives have met with strong resistance from the shop–floor employees and often ended up in industrial tribunals.

4.4.2. Data Analysis and Display (Case Narrative)

There was no documented MS at Metalco B. Key strategic decisions pertaining to the manufacturing structure were often initiated at the senior management level. The Operations Manager initiated most of the manufacturing infrastructure decisions that did not require major financial/resource commitments. Decision–making and action–taking took varied forms displaying both formal and informal elements. Some of them did follow a more rational or analytical route while others were actioned at the lower levels of management with formal approval or informal consent from the higher levels of management. Three major strategic initiatives with accompanying decisions and actions were analysed with a view to identifying any common patterns among them.

A decision made by the General Manager (GM) to shorten the production runs with an aim to reducing delivery lead times was followed by a string of other decisions and actions at the Operations Manager's level. The first decision had been imposed on manufacturing by the GM leaving them with little or no choice but to carry it out. Although this decision had not been made with consultation, or a lot of analysis, the participants believed that, albeit with many difficulties, in the end, it effectively delivered the expected results. The following narrative which is supported by some excerpts taken from the interviews captures the series of decisions and actions associated with this initiative and some of the causal links associated with them.

The excerpts below suggest that the initiative came as a directive from the top with little explanation as to "why" and "how" aspects of it.

> I guess, a study by the then GM of the company, he made a decision that we would run every colour every day instead of batching them.

> So, that was a strategic decision, was made that way and was given to us, and we had to implement that.

> Yeah, that's right, we were told, you must do this, and all complaints were heard but not accepted, and we just had to make the change.

Further interrogation of interview transcripts revealed that this decision was made primarily based on the feedback received from the sales staff and as a proactive measure to counter the potential threat posed by the significantly shorter lead times offered by competitors with their predominantly off–the–self type products. This initiative was of particular interest (and a significant challenge) to manufacturing given that the lead times were already "blowing out" even with the batch production arrangement that existed at the time which gave less priority to slow–moving colours. The following excerpts are indicative of some of those concerns:

> Because the influx of products isn't regular, what typically used to happen was that once we've set our plan, the orders, if they came in higher than planned for a period, lets say for a couple of weeks, lead times would blow

out, and if they came in higher than planned for a substantial amount of time, like three or four weeks, our lead times would blow out badly.

At the time our opportunity for working overtime was limited to an hour and a half a day that we can work with the day–shift crew on overtime. Tied in with this, in a wider background, it has always been difficult to get a full crew of people to work overtime in the morning on the day–shift.

So, that (new initiative) meant a lot to us. That meant that we incurred quite a significant increase in the number of change–overs that we had to do. It also meant that we incurred a significant amount of extra scrap… so, over the following months we had to attack those two areas, and reduce our set–up time and improve our processes so that we didn't generate much scrap.

Because the original decision came as a directive rather than a comprehensive plan, it did not contain any details as to what should be done by manufacturing in order to effect that change. The Operations Manager therefore first had to take action to shorten the production run and then address the resulting issues on a relatively ad–hoc basis. For example, he had to find ways of reducing set–up time and the amount of extra scrap resulted from increased change–over frequency. These had to be undertaken at a time when the plant was struggling with lack of capacity and old and fast–outdating machinery. The company also had a unionised workforce that was quite hostile to change. Not withstanding these challenges, any investments in new plant and equipment etc., had to be justified, particularly, in terms of their return on investment (ROI) in order to obtain formal approval from the higher management. The subsequent decisions and actions and the various routes through which they progressed are illustrated in the data display provided at the end of this section (Figure 4.9).

The second major initiative was seen by the Operations Manager as one that was taken in order to consolidate and sustain the gains achieved through the previous initiatives. According to all three participants interviewed, although it did not involve substantial capital investments or technical inputs, it was considered to be one of the most challenging assignments and one that took much longer to realise than most of the

other major initiatives. As illustrated in the data display, it was also the one that had the largest number of actors directly involved in it.

This initiative which had originated at the manufacturing function–level (as confirmed by the following excerpt) had been first presented to the senior management for approval. It has then been implemented to find heavy resistance from the shop floor staff and has ultimately been resolved through a ruling by the industrial tribunal.

> That was a decision which we took in manufacturing (my supervisors at the time and I), we put that up as a strategy, and it was accepted by the management, it wasn't accepted on the shop–floor, the shop–floor didn't like it, we ended up in the industrial commission over it.

The initiative, which aimed at addressing most of the soft issues associated with the manufacturing infrastructure such as workforce management, production planning and control and organisational issues had taken nearly a year to realise. A number of actions that formed part of this initiative were captured in the following excerpt:

> We did a number of things, we started to maintain our lead times, or to manage our lead times better, we started to cross–train our people so that we can move them between work centres, we set up what we called an A–team on the afternoon–shift. The A–team was a team of guys who we trained up in multi–skills across the product lines, and what we did with those guys was we could shift them across any of the three work centres.

The third initiative – purchasing a new production line – was the most significant in terms of the investment (more than $10 million). It was initiated and progressed as a formal project. Despite many problems, cost overruns and a much longer than expected completion time, this project was considered a success by the company. This is not surprising given the level of uncertainty involved and the technology associated with the project. It was initiated jointly by the GM and the Engineering Manager and was followed by a formal proposal developed by the Engineering Manager. The proposal was widely consulted across functions with manufacturing contributing with its requirements, as well as new ideas for modifications and improvements. The plant

was developed and manufactured by a reputed overseas company to meet the specifications provided by Metalco B which were substantially different to those of similar plants manufactured by the same supplier for other overseas markets. Notwithstanding the extensive preparations and well–coordinated efforts put into the development phase, the project had run into numerous technical problems in its implementation. Some of those problems are captured in the following excerpt:

> The machine was a failure probably for the first twelve months. They hadn't done the automation side of it very well at all. We ended up doing far more changes than we thought. The machine was unreliable and it tended to be unreliable when we were doing change–overs and we had to stop half–way through. That compounded our problems with those two products just when they were becoming increasingly popular. We worked it out and overcame our problems and ultimately the line was a success, though it never hit the promised 120 units in a shift.

WHO?

GM: initiation

Sales Mgmt: feedback

Ops Mgr: execution

Ops Mgr: initiation

Supervisors: implementation

Ops Mgr: initiation

GM: approval

Ops Mgr: initiation

Supervisors: implementation

Top Management: approval

Workers: resistance

Tribunal: approval

GM + Eng Mgr: initiation

Mfg and Sales Mgmt: ideas & requirements

Board of Directors: approval

Mfg Mgr + HR Consultant: implementation

Eng + Mfg Staff: actioning

WHY?

Improve delivery performance

Competitive pressure

Reduce lead times

Reduce set–up time

Sustain reduced lead times

Improve production flexibility

Growing demand Lack of capacity

High–demand season Minimise interruptions

Unanticipated problems

HOW?

Shorten production run

Improve set-up processes, methods and communication

Capital submission [formal proposal]

Re-organise work system Cross–train workers Assemble special crew

Capital Proposal Consultations Evaluations Order Placement Product Development Manufacturing.

Select and train staff; change warehousing and plant layout

Debugging Re-engineering Problem solving

WHAT?

Run every colour every day [Key Decision]

Reduce set–up times and die–changing time

Purchase extra tooling

Reduce scrap

Redesign/Improve work system

Purchase new Production Line [Key Decision]

Delivery; installation and commissioning

Preparatory Measures

Continuous Improvement

WHEN? ← 12 months →   ← 18 months →

Figure 4.9: Manufacturing Strategy Process Map for Metalco B

123

4.4.3. Summary of Metalco B Findings

Metalco B's competitive advantage came from its high–quality products/brand name and its flexibility to offer customised products at competitive prices. In contrast, Metalco's competition was known for offering standard products at lower prices. The company believed its customers were willing to pay extra for those "made–to–order" features and they were also willing to wait a little extra (but not a lot) for that customised product. As such, it strived to improve its operations processes including process technology, organisational systems and work practices in order to enhance delivery performance without compromising flexibility. This had proven to be particularly challenging as Metalco B also offered a range of generic products under a separate brand name that compete for resources in the same plant(s).

The key strategic decisions pertaining to manufacturing structure were often initiated at the GM's level. The Operations Manager made most of the manufacturing infrastructure decisions that did not require substantial financial/resource commitments. They were initiated in response to market needs, potential threats from competition, operational problems, or improvement needs. The initiatives were generally required to be formally approved by either the GM or the Board of Directors or informally endorsed by the higher management depending on the financial/resource commitments involved. The realisation of those initiatives took varied forms along both formal and informal routes. Some initiatives were implemented by senior managers demonstrating certain elements of procedural rationality, whereas others were actioned at the lower levels of management depending on their significance as shown in the data display (Figure 4.9). The time taken to complete/realise each initiative also differed substantially due to such causes as the resistance from the shop–floor staff and the difficulties and uncertainties associated with the assimilation of new technology. Metalco B identified itself as a company that has a hostile organisational culture and a heavily unionised workforce. Despite the management's best efforts to address potential resistance to change in the implementation of major initiatives, they were often influenced, to a large degree, by those organisational factors. The overall patterns in strategic decision–making and action–taking elicited through the analysis of interview transcripts are presented in the following data display (Figure 4.10).

Competitive Pressure;
Market Needs

Corporate Decisions
Directives from
Headquarters [ad–hoc]

Overall Company Strategy
[Growth; Global Integration;
Brand Management]

Competitive Priorities

Major Strategic Initiatives
[Major operational decisions
and investments in process,
technology, facilities]

Management Approval/Consent

Execution/Implementation
project managed by senior mgmt
with inputs from others

Organisational
Performance

Implementation/Actioning
actioned by dept. managers
with inputs from others

Other Initiatives
Small scale investments,
improvements and
workforce issues

Operational Problems
Improvement Needs

Figure 4.10: Strategic (Manufacturing) Decision Process for Metalco B

4.5. Metalco C

This case included three interviews, each up to one–hour duration, conducted with the Production Manager over a period of two months. As the recording of interviews was not agreed to by the participant, notes were taken during all three interviews. Apart from the broader aspects of MS, the interviews mainly focused on key initiatives of strategic significance that had taken place over a period of five years. The later interviews were used for clarifying and confirming the data displays developed based on the previous interviews. Only one internal document was available for scrutiny.

4.5.1. Company Background

Metalco C is an Australia–based medium–sized company with operations across all mainland states. With an estimated 2000 employees and annual revenue of $500 million, the company is a major player in the building products manufacturing sector. It is organised in a geographically–based functional structure with national and state–level management with site–based executives.

Metalco C's market share varies substantially across states and the major customer base is split between trade/commercial and direct sales to the public. The company has been undergoing significant growth/expansion over the past several years including in overseas markets. Metalco C faces significant competition from a few Australia–based manufacturers. Currently, there is no direct competition from overseas manufacturers. In a highly price–competitive local market, the company strives to differentiate its products based on delivery and customer service. Price, quality, delivery and customer service are all cited as important factors for ensuring market success, but flexibility and customer service stand out as order winning characteristics.

Metalco C's manufacturing operations are mainly of batch type. With substantial investments in advanced process technology and improvement capabilities, the company continued to strengthen its volume flexibility and delivery performance. This approach is further strengthened by its substantial logistics operations and distribution network that includes regional warehouses.

4.5.2. Data Analysis and Display (Case Narrative)

Metalco C's strategic initiatives were primarily driven at the state management–level in line with the broader strategic direction set by the senior national management team. The company's overall product–market approach, the annual budget preparation and pricing strategies were all discussed at the regular state management meetings. Strategic operations issues such as capacity, resources, capabilities and training needs were also discussed at the same meetings as they impacted on achieving operational performance. These meetings were informed by a number of sources including information provided by the area sales managers and commercial customers, especially, in terms of changing market needs and competitor behaviour. Other initiatives put forward by the department managers were discussed in the site specific executive meetings before proceeding to the approval and/or implementation stage, or consolidating into more comprehensive projects to be considered at the state meetings.

The major decisions regarding the manufacturing structure were initiated at the state operations managers' level. For instance, one Operations Manager initiated a number of investment decisions relating to site expansion, capacity upgrade and facility layout, which were often identified as part of the company's growth–based and/or long–term requirements as reflected in the following excerpts:

> Two years ago, volumes had increased to a level where we could not sustain service levels unless we changed strategy.

> What if we continued to have this level of demand going into the future, say for the next three to four years?

> The need was recognised as a requirement to blend with strategies for extending production and logistics operations.

Other decisions relating to operations infrastructure were often initiated at the department managers' level. For instance, the Production Manager initiated a number of decisions relating to workforce issues including training, occupational health and safety, performance management and industrial relations. Most of these initiatives were aimed at solving operational problems such as absenteeism, employee morale and

communication issues, or ongoing improvements in the areas of quality, lead time and skill levels as captured in the following excerpts:

> Facilities are too cramped …injury incidents and severity figures were higher than industry average …move the production department to what was planned as a better position to achieve a smooth workflow …amount of rework and transfers …current industry standard of two–day lead time.

In addition, a major review of the company's occupational health and safety (OH&S) system was initiated by the National Operations Manager and the GM, prompted by higher than average injury/incident rates, and was formalised by the national management as indicated in the following statement.

> A decision was made to conduct a review/audit of the company's OH&S practices as a national initiative with goals and directions outlined at a national and state managers meeting.

Strategic decisions and actions initiated as above progressed along different paths towards formal or informal approval and implementation, or actioning, depending on their significance. Most of the initiatives originated at the department managers' level were formally presented and discussed/debated at the site executive meetings before they were consolidated into projects and agreed upon at the state–level. Other decisions and actions were either approved at the state management–level or put on hold/terminated depending on their relative merits and urgency. Major investment decisions initiated at the state managers' level, or those consolidated into formal project proposals were submitted for approval to the head office with justifications for resources, expenditure and urgency. Major initiatives submitted to the (national) Head Office for formal approval were often supported by quantitative data and evaluations by relevant state managers. Other key initiatives approved at the state management level also showed some degree of formality in terms of the level of detail and analysis undertaken as part of establishing/evaluating their merits. For instance, the change of plant layout was based on a detailed technical analysis/review of the existing layout and improvement options. For example, those aspects of the facility expansion initiative are reflected in the following excerpts:

It was initiated at the monthly management meeting as a result of some pressure on production during a period of peak demand …we then looked at the possibilities and options of acquiring the adjoining site, moving to a new site and expanding on the current site.

After some formal analysis by the State Manager and the Operations Manager, it was decided to expand on the current site as a short to medium–term option.

Feasibility studies on all three alternatives were submitted to the head office along with justifications for the proposal for expanding on the current site. Other options were rejected mainly on financial [or economic] grounds.

Projects were usually implemented at the state and/or the department managers' level depending on their size/significance. For example, upon approval, the facilities expansion initiative was implemented by the Operations Manager based on a formal project plan covering such aspects as the selection of architects/builders, time line, design approval (by the Head Office) and the council approval of the development application. In contrast, the review of the OH&S system was undertaken by the State Manager with some tasks delegated to the other department managers and with inputs from external consultants.

Other small–scale and/or relatively less significant initiatives which were often originated at the department managers' level were discussed/reviewed by the site executive and actioned by the managers themselves with the consent of the respective state–level senior manager. For example, the Production Manager implemented a number of initiatives relating to capacity, technology, production planning and control, logistics and productivity under the guidance/supervision of the State Operations Manager with inputs from other managers and the supervisory staff. The initiation and progression of major initiatives along with related decisions and actions are presented in the following data display (Figure 4.11).

WHO?

State Mgmt: initiation, approval

Ops Mgr and other Mgrs: implementation

State Mgr: initiation

Ops Mgr: execution

Dept Mgrs: consultation; implementation

GM + National Ops Mgr: initiation

State Mgmt: execution

External Consultants: audits and other inputs

Prod Mgr + OHS Officer: implementation

Other Mgrs + Staff; facilitation

State Mgr: Initiation

GM: approval

Other Mgmt: inputs

External Parties: implementation

WHY?

Increasing sales volumes Capacity problems

Improve workflow Loading difficulties

High incident rate Improve OHS performance Enhance compliance Reduce related costs

Delivery problems Room for new plant

HOW?

Introduce second shift and 24-hour dispatch/receive operations

Formal Analysis [document/review current layout and work flows; identify areas for improvement; design and install new layout]

Formal Review [audit current OH&S policies and practices; analyse historical data; develop risk management system and injury management plan]

Establish OHS committees; communicate new process [formal]; integrate into SAP

Project Mgmt [explore and evaluate alternatives; approve preferred option through capital proposal; implement project]

WHAT?

Scale up production and dispatch/receive operations

Change Plant Layout

Audit/Review Safety System

Install new Safety System

Extend Plant [add capacity]

WHEN?

◄──────── 3-4 MONTHS ────────► ◄──────── 12-14 MONTHS ────────► ◄──── 2 YEARS ────►

Figure 4.11: Manufacturing Strategy Process Map for Metalco C

130

4.5.3. Summary of Metalco C Findings

Metalco C did not have an explicit MS. Its major manufacturing initiatives were driven at the state management level with the guidance of the national executive. The major decisions of strategic significance were initiated at the state managers' level with significant inputs from the Operations Manager whereas most initiatives addressing operational problems and performance improvements were initiated at the department managers' level. Strategic initiatives usually emerged as growth–based needs, responses to operational problems, or improvement needs. In addition, they also resulted from previous initiatives, or were triggered by specific events and revelations.

The overall process was found to be relatively structured with many of the decisions following a formal and relatively comprehensive analysis and consolidation process before being approved at the state or national management level. Realisation was primarily through implementation in the form of projects under the supervision of respective state managers.

As such, although it was not documented, the strategic decision process at Metalco C displayed a relatively high degree of procedural rationality. The aggregate patterns in strategic manufacturing decision–making and action–taking as elicited through the analysis of interview transcripts are schematically represented in the following data display (Figure 4.12).

Corporate Decisions

External Inputs
[consultants/contractors)

State Mgmt Initiation/Review

Headquarters Approval

Overall Company Strategy
[growth/expansion; increase
market share; competitive
priorities]

Major Strategic Initiatives
[major investments &
improvement initiatives]

Management Approval/Consent

Implementation
project managed or
implemented by senior mgmt
with inputs from others

**Organisational
Performance**

Other Initiatives
Small scale improvements
and problem solving

Actioning
actioned by dept. managers
with inputs from others

**Operational Problems
Improvement Needs**
[local/divisional]

Figure 4.12: Strategic (Manufacturing) Decision Process for Metalco C

132

4.6. Technico

This case involved eight interviews, each up to one–hour duration, conducted with five supervisory to senior management staff representing manufacturing, marketing, procurement and quality management areas over a period of three months. Most of the interviews were recorded and transcribed into text, whereas notes were taken during the remaining interviews. No internal documents were made available for scrutiny. The interviews focused on major decisions and actions that had taken place over a period of three years, along with the broader aspects of strategy formation.

4.6.1. Company Background

Technico, an Australia–based privately–owned company, with its operations across the Pacific region, claims itself to be a market leader in the information technology (IT) manufacturing sector. With annual revenue exceeding $60 million, it employs about 180 staff across three sites – an assembly plant, central logistics operation and a national help–desk facility. Over a period of twenty–five years, it has grown steadily to consolidating at its current position as a leading IT solution provider.

The company serves a wide cross–section of the public and private sector organisations and re–sellers in Australia, New Zealand and the Pacific Islands. Technico faces competition from a wide range of local and overseas suppliers; however, the company endeavours to restrain or avoid their threat through relationship and service–based approaches to marketing. Technico's overall strategic direction is to grow within the preferred market segments, building on its current market position as a total IT solutions provider. Technico's product–market strategy is strongly tied to those of the partnering original equipment manufacturers (OEM). The company believes that its competitive advantage comes from superior customer service (including its close relationships with key customers), delivery performance, flexibility and the high quality of its product/service offerings.

Technico is organised based on an empowered team structure and led by a small team of intrapreneurial managers who have been assigned with functional responsibilities.

The critical role of the workforce in maintaining delivery flexibility and post–sales service is well–recognised within the company. This was reflected in major strategic actions such as improving manufacturing culture through focused initiatives, investing in the company's own call centre and the relocation of the R&D function to the manufacturing floor. Employee empowerment, role ownership and accountability and honesty and integrity are recognised as the three pillars of a strong positive organisational culture.

Manufacturing/assembly operations are predominantly labour–intensive with limited use of technology in such areas as material handling, product testing, production planning and control and inventory management. The company has recently made some significant investments in operations infrastructure that supports its service function by way of updating technology and maintaining a skilled workforce.

4.6.2. Data Analysis and Display (Case Narrative)

Technico did not have an explicit strategy at either the business unit or the functional level. However, there was a shared understanding, among almost all participants, of what the company's overall strategic direction was, what the markets were like within the industry sector and how the company should compete in its preferred markets, as well as what each department's and sub–department's role should be in supporting the overall strategic goals of the company.

Technico's strategic direction was to pursue growth towards the service end of the market (forward vertical integration) with a view to become a complete IT solutions provider in their preferred market segments. As the following interview excerpt indicates, the management believed that the short product life cycles and the rapidly changing market made the long–term forward planning (any longer than one year) unrealistic and ineffective.

> The longest time frame that we're working on is twelve months, no five–
> year plans, and really the working time frame is three to six months. I think
> that's fairly relevant to our business.

As such, the majority of decisions at both strategic and operational levels came about as collective and cumulative responses to market forces as discussed and agreed upon by the relevant senior managers. For example, the following comments made by one senior manager on the way competitive priorities were arrived at illustrate the informal and subjective nature of the process.

> It's really intuitive, there is no formal process there, and it's more a case of cumulative learning, trying to recognise those strengths, and more or less casual. I think that's a case of reviewing what we have done and what we would like to do and recognising what we do well, so let's do more of that.

The influential role played by the Managing Director (MD) in shaping the company's strategic decisions and actions was also reflected in both the general descriptions as well as the specific narratives, a sample of which is provided below:

> That's pretty much done by the MD, the two directors, sort of the MD and the marketing manager in terms of what those initiatives will be.

> MD has got his fingers in the pie everywhere, so he knows what's going and what's coming and where we're successful.

Quality, customer service, delivery flexibility and price were all cited as the bases of competition, although it was generally recognised that not all of them were equally important in winning orders in each and every market segment. Further analysis of interview transcripts revealed that customer service and flexibility played a significant role in winning orders across all market segments, whereas price was particularly important in winning new contracts. Although product quality was maintained at a high level, in most cases, product quality itself did not stand out as an order winning characteristic. This was partly because of the substantial service component included in the total solutions (product–service package) offered to its major customer base.

The strong focus on customer service was emphasised in the following excerpts taken from the interviews conducted with one senior manager.

If you and I had a relationship, and if you are happy with that relationship, we get the tender. To me, the most important thing – may be not from the sales person's side, sales person wants to make money, get cheaper components and keep the customer happy – we don't want to be the cheapest, we want to be based on total solutions, you get a great product and it is lasting for the period of time (that you were told), you get prompt support. And, you know, it's making a commitment and having the infrastructure to support it.

You have to be dynamic to survive in this industry. If someone pays you to go and paint a house, and you are an IT company, guess what? You got to be a painting company as well, and I'll go and paint it, that's how we operate. You get paid for it, and you think you can do it; go for it… that's the way we work. So, you really need to understand what the market needs and you need to deliver what your customer wants to get.

When prompted to comment on the capabilities required to support such a broad approach, the same participant responded as follows:

We wouldn't be in business today if we didn't have those (capabilities). It is a unique industry and the fact that we know what's going on and we are not a Tier–1 company like those multinationals, we are a Tier–2 company.

The following excerpt taken from the interview with another senior manager further substantiates that claim.

That ability to respond is really one of our big strengths here. We drive them (manufacturing) crazy because it disrupts the process and so forth, but without that we wouldn't have been anywhere near the business.

In the absence of a documented strategy, manufacturing's understanding of the company's strategic direction came mainly from the information shared among senior managers and the decisions made and the actions taken by the executive over time. For example, the Manufacturing Manager had a certain perception of what bases the company was competing on, though it was not fully consistent with the overall

product–market strategy elicited by the Product Manager. Despite the broad consensus and shared understanding reflected in the interviews, the way strategy was operationalised was driven by the managers' interpretation of what's being taken up for discussion at the senior management level and each manager's own conceptualisations of how they would, as a group, contribute to achieve the overall objectives of the company. It was also shaped by the personal attributes of managers such as their values, beliefs and philosophical stance. These perspectives are reflected in the following excerpt:

> Yes, I have some goals. In my point of view, the biggest issue is perception. It's customer perception. It's not what happens at the end of the day, it's the customer's perception of that. If customers think that you are making a bad product, because it's what they hear from other people – that's the perception. There may not be any truth in that. It's about creating the customer perception that we have done a good job.

Some of the initiatives that were representative of this interpretation included measures aimed at building customer confidence in the company's products such as providing customers with a detailed report on parts used and the quality assurance steps followed with respect to each component. A similar aspect – the organisational culture – associated with another initiative is reflected in the following interview excerpt:

> Changing people's attitude towards work; my belief is that people will need to pull together in order to achieve something. The bottom line is not about people (themselves), it's about attitudes. If you've got the right people with right attitude you can achieve anything.

The improvements expected to be achieved through the above initiative were related to areas such as productivity improvement, resources sharing across functional boundaries and reducing absenteeism, as illustrated in the process map (Figure 4.13).

The narratives provided by the participants about the strategic initiatives were quite helpful in establishing certain patterns in the way they were arrived at and realised. For example, a decision to set up a call centre and another to purchase new equipment,

were both made subsequent to securing a major contract with a new customer, and a third decision to expand the facility was made after receiving a large order. However, neither of those decisions was made spontaneously as a result of securing the new contract/order alone. They have been under consideration for some time as means of enhancing customer service and addressing capacity problems though the new contract had triggered the commitment, perhaps because of the financial security that came with it. This observation was supported by some explanations given by one senior manager regarding key investment decisions made within his area of responsibility.

> You should perhaps expect to describe it – someone sits down and goes, we should do this, we should do that … it doesn't work like that, its more responsive, and its more case–by–case and suddenly it gets priority. …the best way to put that is – the company tries and manages to develop business opportunities first and then infrastructure is put in place to meet that opportunity. … I think that's the key to being successful.

However, there have also been a number of other occasions where initiatives gradually progressed in a more incremental fashion through building consensus of, and support from, the key managers and committed to with the formal or informal consent of the MD. An example is the actions taken in relation to re-organisation of the workforce aimed at strengthening the positive organisational culture. The decision to relocate the R&D section closer to the production function was also evolved in a similar fashion but had, eventually, to be formally authorised by the MD in consultation with relevant managers prior to its implementation. In contrast, the implementation of a new ERP system took a substantially different form in that it was undertaken by a team consisting of MD and managers from accounting, logistics and information systems as a formal project with extensive planning, preparation, consultation and analysis.

The narrations of strategic initiatives supported by the general descriptions on the broader aspects of strategy formation (such as the degree of formality, the basis of competition and the strategic direction of the company), as elicited above, provided the foundation for establishing the recurring patterns of progression of strategic initiatives which are presented in the following data display (Figure 4.13).

WHO?

Mfg Mgr: initiation; actioning

MD + Senior Mgmt: consent

MD + Senior Mgmt: initiation and agreement

Board of Directors: authorisation [formal]

MD + Senior Mgmt: agreement/approval

Mfg Mgr: initiation and actioning

MD: Initiation

Production + R&D: Implementation

WHY?

Order backlogs Delivery issues

Improve productivity and increase capacity

Improve employees' attitudes towards work [change habits]

Fulfil contract terms Establish good will [Relationships]

Enhance service orientation; address performance problems

Lack of capacity

Enhance problem solving capacity

Improve interaction between. R&D and production

HOW?

Reinforce current positive culture

Assign ownership of the jobs to individuals Empower employees Mfg Mgr as role model

Project Manage [contract/procure; build/install]

Introduce new shift

Implement [plan; organise; coordinate]

Mfg Mgr organises and executes work on priority basis

Physical relocation of the R&D section closer to the production floor

WHAT?

Evolving culture: open, honest and caring team environment

Workforce reorganisation [incremental]

Building a positive organisational culture [improving efficiency]

Securing a substantial contract with a new customer [Key Event]

Set up call centre

Acquire new burning machine

Receiving a sizable, urgent order [Key Event]

Facility Upgrade [expand floor area; improve plant layout]

Relocate R&D section

Building a positive organisational culture [promoting innovation]

WHEN?

PRE-2000	2000-ONGOING	2000	2001	2001	2002	2002-ONWARDS

Figure 4.13: Manufacturing Strategy Process Map for Technico

139

4.6.3. Summary of Technico Findings

Technico had no documented strategy and the majority of decisions and actions at both the business and the functional level came about as collective responses to market forces. The management believed that the short product life cycles and the rapidly changing business environment made long–term forward planning unrealistic and ineffective. The company's strategic intent was to secure growth through moving towards the service end of the value chain by way of offering total solutions within its preferred markets.

In the absence of an explicit strategy at any level of the business, the holistic objective of the operations function at Technico was to satisfy the needs of the marketing and sales, which in turn, they believed, would satisfy the customer, leading to business success. Investment opportunities were mainly identified by senior managers (often on an individual basis) as they either fulfilled the requirements of a major contract or addressed operational problems as part of cumulative learning. These initiatives were then subject to review by the senior management in an intuitive fashion with the resource commitments endorsed by the MD. Communication of the decisions through to the lower levels of the hierarchy was informal except for what's been communicated through the work instructions, basic company procedures and rules and regulations.

The way in which the Manufacturing Manager assessed the influence of various internal and external contextual factors on the operations showed to have significantly shaped the characteristics of the operations structure and infrastructure. This aspect was also reflected in his thematic statements such as "making things happen" and "getting things out of the door as soon as possible" used by the participants. Given the nature of the product, and that no large capital investments in terms of plant and equipment or facilities were involved, the company enjoyed the flexibility associated with responding to volume changes with minimal requirements for capacity additions in large chunks. The review of major decisions and actions that had taken place over three years revealed that this structure was consistently present with almost every initiative. The overall process is presented in the following data display (Figure 4.14).
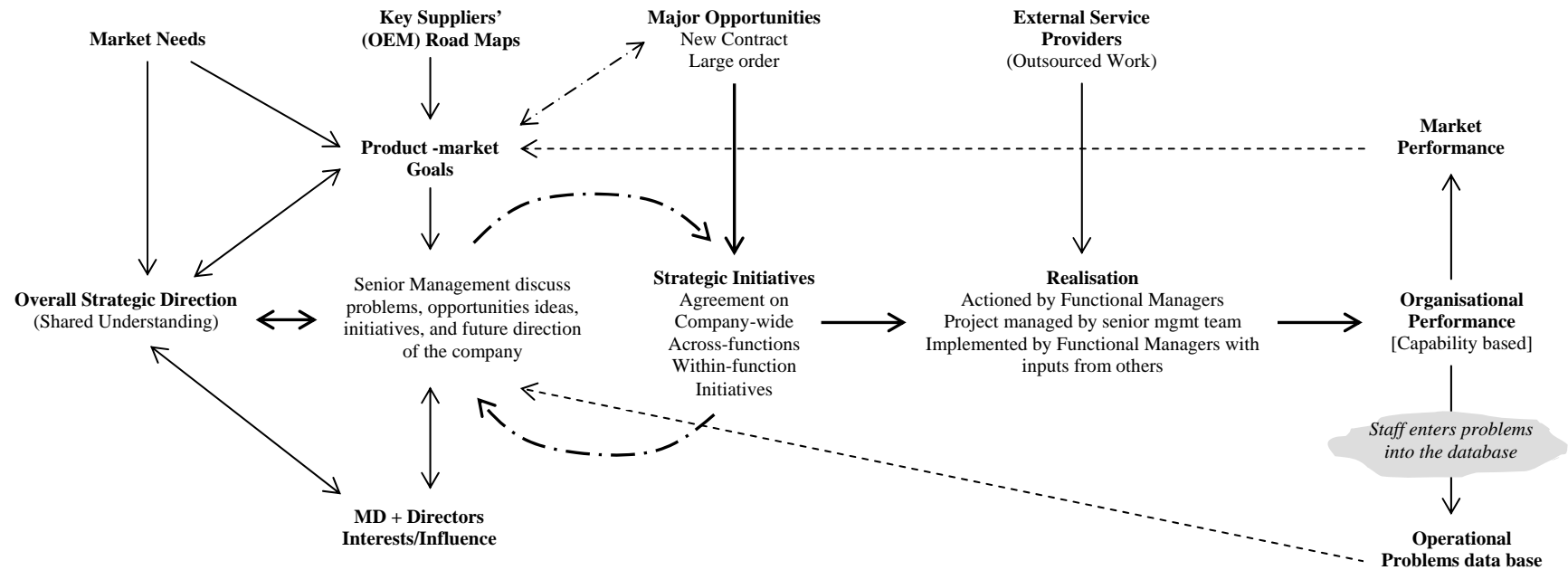
Figure 4.14: Strategic (Manufacturing) Decision Process for Technico

4.7. Ventico A

This case included six interviews, each up to 90 minutes duration, conducted with four supervisory to senior management staff over a period of three months. The first round of interviews with all four participants were recorded and transcribed into text and notes were taken during the other two interviews. Apart from the broader aspects of strategy formation, the interviews focused on a number of initiatives of strategic significance that had taken place over a period of five years. The later interviews were also used for clarifying and confirming the data displays developed based on the previous interviews. A few internal documents were also used as source material.

4.7.1. Company Background

Ventico A is a leading manufacturer of a reputed brand of building service products in Australia with its operations/sales throughout the country. The company has been in operation for more than 20 years as an Australia–based proprietary business and its market comprises mainly builders/developers in the construction sector. Ventico A holds a significant share of the Australian market, and has no overseas presence. With an annual turnover exceeding $50m and more than 100 staff employed across three states, Ventico A is undergoing healthy growth – currently it is either expanding into or consolidating its presence in all states and had doubled its size over the last 5 years.

Ventico A's products are competing against those of the reputed multinationals that carry popular brand names. Due to the competition from these branded products, the customer loyalty is maintained primarily through strong after–sales service and product support. However, some unique product features that favour Australian conditions and advanced technologies associated with the products also give the company an advantage over the products sourced from overseas, thereby partly contributing towards retaining a loyal customer base. As such, Ventico A is competing primarily based on superior quality and customer service backed up by a strong after–sales product support and an extended warranty scheme. Although its products are priced competitively against rival offerings, the company's intention is to move away from competing based on price.

The demand for Ventico A's products is subject to seasonal variations, closely tied to the economic/business cycles and is also sensitive to the changes in the construction sector. The production processes used are mainly of small batch/assembly type with a recently revised production management approach that moved away from the previously held assembled/made–to–order towards an assembled/made–to–stock basis.

Ventico A has a functionally–based hierarchical organisational structure with a fairly well–defined authority matrix and largely informal/open communication structures that encourage management–employee rapport. Following a recent change in the way senior managers were recruited, some signs of coalition formation were evident within the company, although they had not evolved to a level that was detrimental to the functioning of the firm.

4.7.2. Data Analysis and Display (Case Narrative)

The majority of the decisions and actions at Ventico A were initiated at the department managers' level and reviewed/discussed at the senior management level before they were submitted for approval by the managing director (MD) or the Board of Directors. The remaining decisions and actions, which were initiated at the senior management level, were approved by the Board of Directors with the agreement of the MD. The majority of initiatives had emerged as responses to internal problems, improvement needs and growth–based needs or as intapreneurial ideas of senior managers. For example, some operational issues which have been evolving over a period of time were culminated in strategic initiatives, often triggered by events such as a market opportunity or a growth–based need reaching a point when urgent action was required, as illustrated in the following excerpt:

> The decision to move to this site was by necessity, not by great planning, the basic fact was they ran out of space, the physical size of the building they were in just couldn't cater for the volume of products they were trying to produce, which forced cost increases. That means we've got to run more overtime, because we can't put more equipment in, we got to run more hours, more hours mean greater costs.

The other operational problems and improvement needs were identified at supervisory and department managers' level and progressed through either a more formal path towards approval by higher management, or affirmation by the department managers to commit resources and were followed by implementation or actioning. One such initiative is partially described in the following excerpts:

> I put a proposal to smooth our production out, to smooth our numbers out so that we can build the same units for eight months in a row, so that we have the same number of people and we have got the same demand on materials… but that meant we were going to have to stock a lot more than we had in the past. So, in other words, it's an investment. It costs you to put it on the shelf, lets say x million dollars worth of products on the shelf. I had to get that approved from the directors and the owners.

> So, I went to the General Manager (GM) and said, if we were to stick to the old system, we are going to lose people and we are going to put people off, and we will have to put them back on later on, re–train them again. The skill levels and the quality achieved in having a consistent workforce compared to putting people off and back on and training them again, outweighs the costs of, lets say x million dollars worth of products for three months with the interest, it works out to be more economical that way.

All major initiatives were informed by the evolving strategic direction shared by the senior management (as discussed in the monthly business development meetings) which, in turn, shaped the strategic direction by way of their cumulative impact on the business, over time, as reflected in the excerpt below:

> We have a formal monthly planning meeting on demand and sales and in that meeting between, you know, the Engineering Manager, Sales Manager GM and myself, we all sit around and talk, we talk about what's coming up over the next year, next two years, what's the demand going to be like, from that big overview we then take it down to smaller–level within the business and look at whether we are going to meet those demands.

The senior management's knowledge (as most of them were shareholders of the company) of the company's future directions helped refine the initiatives to match with the Board of Director's interests and to guide lower–level management in their decision–making. The informal nature of this process is reflected in the excerpt below:

> There is no major decision–making process, people have a rough guide. It's a bit of gut–feel and if I am not comfortable with it, it's pretty hard to get factual information on the system, so I go and have a chat with my boss. If you want to make a decision outside your routine work you ask your boss for approval, so, it's informal but it is definitely not reckless, and there is no person here who makes thousand odd decisions on his own way.

Initiatives presented to the Board of Directors were supported with quantitative analysis (where available) as well as subjective evaluations. Once resource commitments were made at the top management level, the majority of initiatives were implemented under the guidance of senior management and often with the direct involvement of department managers. The remaining initiatives were actioned by the initiators themselves (mostly department managers) with the consent of the higher management. Some aspects of the implementation/actioning of initiatives are captured in the following interview excerpts:

> That was finally approved about two months ago. All the managers were happy. It wasn't a one–man decision. We had to get everyone's confidence in it. Everybody knew it's going to be a long–term commitment.

> We are working on the IT side now, and it seems to be a bit hard, but we are having a meeting this Wednesday. We transferred the stock three weeks ago, so we are just trying to iron out small things that are happening at the beginning. We just can't point the finger at them, it exposes the problems that we have. If we want to ask them to do this, this and this, then they will ask you to do this, this and this too. So, we want to change here as well, we just can't see it as one–way traffic. If we want them to have the goods down there at seven o'clock in the morning we got to have the goods there first. So, they are the things we are going through right now.

The decisions initiated at the senior management level were perceived to have held the highest level of strategic significance in terms of risks and returns, the financial commitments involved, as well as their impact on the future success of the business. Top management had not only shown a personal interest in those initiatives but also had overseen them until they were fully realised.

In contrast, the decisions initiated at the department managers' level were those that underwent the most detailed analysis with a high degree of procedural rationality, and were often required to seek formal approval. Those decisions were generally considered to be strategically significant in terms of their impact on the long–term success of the business, but did not involve large sums of capital outlay compared to those initiated by the senior management.

The decisions initiated at the junior management levels were observed to have had a relatively low level of strategic significance but considerable financial commitments, as well as significant operational implications. The other decisions that were initiated at the lower levels of management and/or did not require formal approval from the senior management were considered to be reversible – that they can be changed at a relatively low cost and/or with minimal long–term implications on the business.

Overall, the decisions that required formal analysis and were associated with a high degree of procedural rationality took longer to realise than the rest of the decisions. The decisions that were initiated at the top management level also took longer to consolidate. Therefore, if any decisions were initiated at the top management level and required to undergo formal analysis/evaluation, then those decisions took the longest time to realise. There was no evidence to conclude that any of the initiatives had rushed through due to urgency driven by external forces such as changes in the market and competitor pressure. There was also no evidence to suggest that initiatives were delayed by any internal political activities or employee resistance. However, some decisions had been progressed in an iterative fashion with requirements arising for detailed information processing at each stage, and in turn, resulting in more refined and favourable outcomes at progressive stages. Otherwise, the majority of decisions had progressed in a relatively orderly manner as depicted in Figure 4.15 below.

WHO?

| MD: initiation; execution | Mfg Mgr: initiation | GM: initiation; execution | Mfg Mgr: initiation; implement | MD + Logistics Mgr: initiation; execution |

| Shareholders: agreement | MD + Shareholders: approval | MD + Shareholders: approval | Materials Mgr: inputs | Finance Mgr: facilitation/inputs |

| Contractors: implement | Mfg Mgr + Eng Mgr: implementation | | | Shareholders: approval |

WHY?

| Lack of space for growing operations Outdated plant/facility | Lack of capacity to meet future demand | Security of parts supply; growth/vertical integration [company strategy] Financial situation of the target business [opportunity] | Issues (poor service) with current agency | Poor service level with current contractors; growth strategy |

HOW?

| Explore options; evaluate alternatives; agree on location; purchase and build; relocate | Capital proposal; sign-off order; site preparation; delivery/installation; commissioning | Appraise business case; senior mgmt agreement; negotiate with owners; sign-off acquisition; handover/transition | Approach new contractors; receive quotes; consult with other mgmt; select new service provider | Explore options; economic evaluation; shortlist potential contractors; negotiate; senior mgmt conference with contractor; sign-off contract |

WHAT?

| Plant Re-location Facility Upgrade | Purchase new machinery/equipment | Acquire another business | Change HR agency | New contract for logistics |

WHEN?

| 12-18 months | 5-6 months | 4 months | 2 months | 6 months |

Figure 4.15: Strategy Process Map for Ventico A

147

4.7.3. Summary of Ventico A Findings

The company did not have an explicit strategy in documented form. Neither did it have a formally–recognised manufacturing strategy in place. Instead, the managers' decisions and actions were guided by the big picture scenario established and agreed upon at the monthly business development meetings. These initiatives progressed showing consistent patterns as illustrated in the data display that follows (Figure 4.16).

The business development meetings were attended by the senior management and all department heads. In addition to reviewing and establishing monthly sales targets and demand forecasts, strategically significant issues such as future business scenarios, investment opportunities and growth/expansion strategies were discussed and reviewed at these meetings. These meetings also served as the forum in which the strategic initiatives were formally presented by departmental managers for discussion/comments before they were approved at the Board of Directors/shareholder meetings.

Some senior managers also happened to be the major shareholders of the company. Usually, the meetings took the form of brainstorming sessions where ideas were bounced back and forth before intuitive judgments were made regarding the feasibility and business value of strategic initiatives. When initiatives were presented in the form of formal proposals (mostly those initiated by the junior management, or the ones that involved large financial commitments), they were often supported with quantitative/ historical data and financial/economic evaluations. All major decisions were formally signed off by the shareholders/directors of the company before they were realised.

The realisation of initiatives took varying forms depending on their size (financial commitment involved), strategic significance and the actors who initiated them. Major initiatives involving large capital outlays were implemented or executed by the senior management while other initiatives were implemented or actioned by department managers with active involvement of supervisory staff. In some instances, external parties were also involved in certain initiatives (for example, outsourced work and consulting/audit inputs). The aggregate patterns of strategic manufacturing decision–making and action–taking are schematically presented in Figure 4.16.

Market Needs

MD + Directors
Interests/Influence
[weekly meetings]

Product-market
Goals

Growth-based
Needs

External Service
Providers
(Outsourced Work)

Senior Mgmt Judgement; Analysis of
Historical Data; Iteration

Formal Approval; Consent of Higher
Mgmt or Affirmation by the Initiator

Overall Strategic Direction:
implicit
[cumulative/evolving]

**Monthly Business Development
Meetings**
Senior Management discuss
problems, opportunities ideas,
initiatives, and future direction of
the company

Major Strategic Initiatives
Major investment decisions

Other Initiatives
Small scale investment, operational
issues, improvement needs and
workforce related

Realisation
Executed/implemented by
senior mgmt; implemented
actioned by dept mgrs and
supervisory staff

**Organisational
Performance**

**Internal problems
Improvement needs**

Figure 4.16: Strategic (Manufacturing) Decision Process for Ventico A

149

4.8. Tronicsco

This case included two interviews, each up to 90 minutes duration, conducted with the General Manager (GM)–operations of the company over a period of eight weeks. The first interview was recorded whereas notes were taken during the other. Due to the difficulties in agreeing to further interviews with other participants, this case allowed limited analysis and opportunity for corroboration. Apart from the broader aspects of manufacturing strategy, the interviews focused on a few strategic initiatives. The second interview was used for clarifying and confirming the data displays developed based on the first interview. No internal documents were available for scrutiny.

4.8.1. Company Background

Tronicsco is a successful privately–owned Australian company within the electronics manufacturing sector with over $60 million annual revenue and 150 employees. It has a functionally–based hierarchical structure with matrix links to project/customer (key account) management leadership. The company's customer base predominantly consists of global multinationals. Orders are won on the basis of price, flexibility and delivery speed. With the growing competition from low–cost manufacturing in developing countries, in this industry sector, price is becoming increasingly critical. However, the company's competitive advantage, at present, comes mainly from the volume flexibility and delivery speed. Although quality is an important aspect of maintaining customer loyalty, over time, it has become more of an order qualifier.

The operations processes of Tronicsco are specifically designed to meet its competitive priorities. For example, flexibility needed in managing short to medium–term capacity in terms of labour, plant and equipment, warehouse space are built into the operations system through such deliberate means as the use of agency staff, rented premises and some excess capacity in machinery and equipment. Investments in new technology have further strengthened that position. This is also supported by relatively high levels of raw materials and components inventory. The issue of skill levels associated with the casual staff is addressed, to a degree, by the use of technology and/or automation.

4.8.2. Data Analysis and Display (Case Narrative)

The majority of the strategic decisions and actions at Tronicsco were initiated at the senior management level in response to major customers' needs and/or in order to meet specific competitive priorities which were guided by its unique business model. The major decisions initiated by senior managers were subject to review by the senior management team (GM–operations, MD, and Finance Manager) before progressing to the next stage. However, some decisions relating to process improvement and problem solving, which typically evolved over a considerable period of time, were culminated in the form of capital proposals that were initiated at the technical specialists' or department managers' level. These decisions were subjected to review by the senior management and were approved (or put on hold) before they were implemented by the department managers as partially reflected in the following excerpt:

> We have a formal capital investment process. Approval process for proposals is also tied to the size of investment. I can approve up to a limit of x million dollars and anything above that should go to my boss, with my recommendations, and above a certain limit should go to the Board of Directors. But every decision does not follow that route.

Overall, the decision process was predominantly informal, and in general, recognised the significance of flexibility required in the operations system. For example, although the company had a formal capital evaluation process, some investment decisions (sometimes even the major ones) had not followed that process. Some investments that the management believed to be important in terms of improving the firm's long–term competitiveness were not comprehensively evaluated. Instead, resource commitments for those projects were made based on the gut feelings or intuitive judgements of the senior management as captured in the following excerpts:

> It was an 800,000 dollar investment. We didn't have to buy that machine, no one told us to buy it, and the customers didn't tell us. We made that decision because we felt that in the longer–run it will be a good investment. We thought that if we had this we could do a better job.

So a proposal was put together and the consensus and approval was purely based on faith–we looked at the pay–back period but it was not attached to a particular project so we couldn't precisely work out how we can spread the costs or articulate the benefits. The engineers held the view that we could improve product quality if we had this.

In addition, a major contract with an important customer triggered another investment decision and it was finalised over a short period of time, again, on an intuitive basis as reflected in the following interview excerpt:

The decision to invest in an extra machine worth 500,000 dollars was made almost overnight. That was to accommodate an order from a customer. We didn't have much time to ponder. Overall, it didn't take more than three to four days to finalise the decision.

In most occasions the senior management collectively evaluated an initiative's merits or otherwise in an intuitive fashion. According to GM–operations, this approach had worked well for the company for over a period of twenty years. The informal aspect of decision making is explicitly expressed in the following statement:

Decision–making is more or less informal or ad–hoc, being a private company and a specialist manufacturer we don't have to report to a market or shareholders. We make decisions based on long–term health of the company, and we don't worry too much about short–term costs.

All decisions, irrespective of how they were initiated, once agreed upon by the senior management, were executed or implemented depending on their urgency, size and complexity. For example, a decision to procure a new piece of equipment (from overseas) was made within four days and executed immediately afterwards in order to fulfil the requirements of a new order. In contrast, another initiative to introduce a new enterprise resource planning system was implemented via a pilot run and a change of vendors twice (from the first vendor to a second one and back to the first vendor) over an eighteen–month period in trial and error style. The progression of three major initiatives is depicted in the following data display (Figure 4.17).

| | WHO? | WHY? | HOW? | WHAT? | WHEN? |

WHO?

Engineers: initiation; actioning

Senior Mgmt: review; agreement

MD/Board of Directors: approval

Senior Mgmt: initiation; assessment; approval

MD/Board: approval

Dept Mgmt: execution

Senior Mgmt: initiation

Board of Directors: approval

Project Team: implementation

External Parties: inputs

WHY?

Evolving needs (quality)
Long-term benefits
[proactive]

Requirements of the contract/order
Long-term benefits

Operational problems
Manage business risks
Long-term benefits

HOW?

Capital proposal
Senior Mgmt consensus
Resource commitment
Procure & Install
[**project manage**]

Senior Mgmt consensus
Resource commitment
Execution

Project Manage
[set up team; develop project plan; evaluate options; negotiate with suppliers; commit resources; implement, review, modify…]

WHAT?

Purchase of machinery/equipment

Major order from a customer   [Key Event]

Invest in new process technology

Introduce/implement new ERP system

WHEN?   ← **3–YEARS** →

Figure 4.17: Strategy Process Map for Tronicsco

153

4.8.3. Summary of Tronicsco Findings

Tronicsco's strategic operations decisions and actions were guided by a set of simple rules and/or principles that recognised the specific needs of its major customers, such as flexibility, price competitiveness and delivery speed, subject to the intuitive judgements of the senior management (shaped by intrapreneurial skills and/or visionary leadership). Decisions were agreed upon by the senior management based on their urgency and significance in terms of meeting a specific customer requirement in the short–term or fulfilling a business need leading to perceived long–term business success. Resource allocations were guided by the requirements demanded by the unique business model in which both volume and process flexibility were recognised as key features. In addition, a supplementary process where small–scale and/or more routine type decisions were initiated at the lower levels of management and implemented or actioned through formal and informal mechanisms also emerged through the analysis of limited interview transcripts. The overall strategy process with an emphasis on manufacturing decisions and actions is presented in the data display below (Figure 4.18).
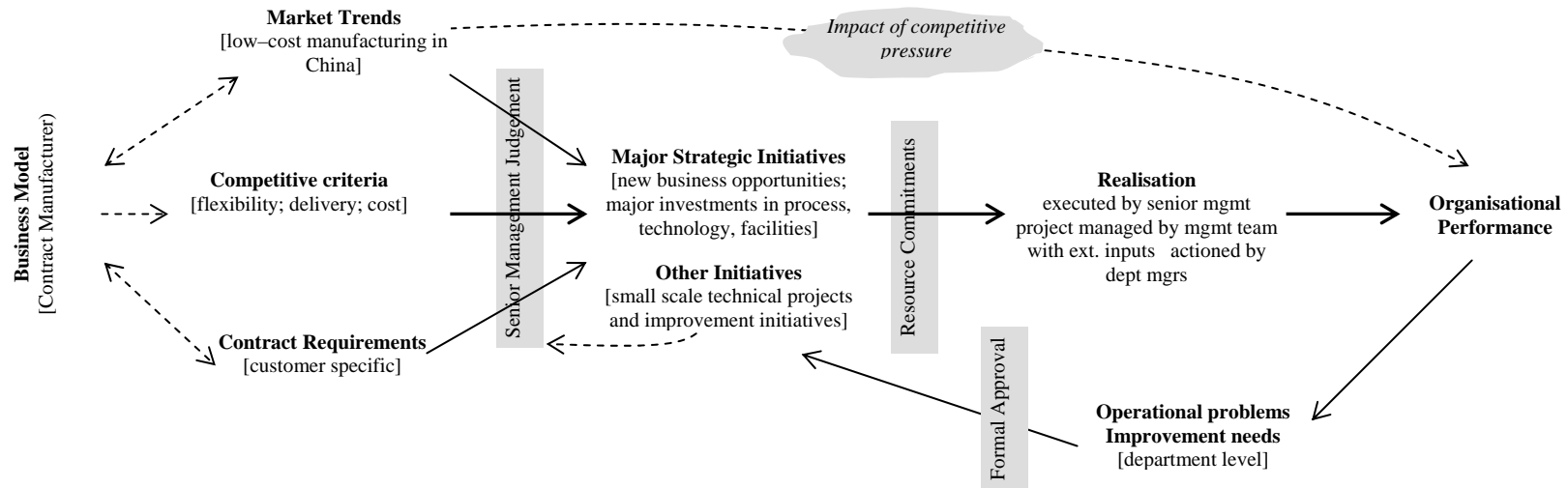
Figure 4.18: Strategic (Manufacturing) Decision Process for Tronicsco

4.9. Machineco

This case included four interviews, each up to 90 minutes duration, conducted with the Managing Director (MD) and one other supervisory staff over a period of three months. Only the first interview with the MD was recorded and transcribed into text whereas notes were taken during other interviews. No internal documents were available for scrutiny. Opportunities for corroborating data through alternative sources were limited in this case due to the small number of participants involved. As such, the second and third interviews with the MD were also used to refine and clarify the data displays developed based on the other two interviews.

4.9.1. Company Background

Machineco is a small (micro), privately–owned company operating in the machinery and equipment manufacturing sector. It was founded about 60 years ago to supply speciality consumables to the heavy manufacturing industry. Over a ten–year period, subsequent to a change of ownership in 1992, the company has grown from a small–scale equipment/consumables supplier/maintenance service provider to a technology developer/small scale manufacturer of "state–of–the–art" equipment that exceed the performance and quality standards of internationally renowned brands. It employs nine full time staff with annual revenue of just over $1.5 million, and is catering predominantly to the Australian market with limited exports to a few other countries.

The company serves a niche market segment within the heavy manufacturing and process industries, which face competition from low–cost manufacturing in developing countries. As such, its product–market strategy involves a focused self–paced growth in those niche markets that large multinationals could not compete with successfully due to their lack of flexibility and poor scale economies. Machienco's competitive priorities can be broadly identified as superior quality and flexibility associated with its service/product offerings. In addition, innovative new product development is at the heart of the company's operations while the entrepreneurial leadership and the creative and motivated workforce have provided an environment conducive to generating and testing new ideas on the shop–floor itself.

Production processes used are mainly of job shop/small batch type. The company's product development/manufacturing capabilities had substantially improved over the last decade from simple reverse–engineering of competitor products to complete design, development and manufacturing of its own brands that outperform competitor offerings. The company uses advanced technologies in order to keep pace with the latest developments in process technology and has continued to acquire extra capacity and flexibility through upgrading of process technology and machine tools etc. The MD believes that the company is capable of entering the international market, but it lacks the financial capacity and marketing capabilities required to grow on that scale.

4.9.2. Data Analysis and Display (Case Narrative)

Although the company did not have an explicit strategy, the MD's descriptions of the changes that had taken place over the past several years elicited consistent patterns in the strategic behaviour of the company. For instance, the thinking behind the company's recent change in strategic direction, as captured in the following excerpts, was indicative of a desire for focused, self–paced (incremental) growth:

> One was that I had an ambition to go into manufacturing. Two, we have to find growth – we actually had to go into manufacturing. We couldn't stay where we were. There is no growth in the market. So, it was always to see if there is a niche and we are developing products for that niche, and we are heading more and more in that direction, that's where we go.

> I don't see us as being focused on the ability to become as twice as big next year – never thought that way. It's what we can make next, what we can improve, we are now starting to say; why don't we look at international markets?

The other key aspects such as the basis of competition and the product–market strategy could also be extracted from the interview transcripts as shown below.

> I mean we make a lot of gear that stand out; a German company came and asked us if they could buy our gear and sell them in Europe and Indonesia.

The one thing that I really enjoy is making the people up in the big companies coming to see us – we are not going to them. We are point one of a per cent of the market and they still consult with us. If they don't consult with us, then they hate us. I mean, you just can't get a better accolade than that – be hated by the biggest people in the industry …for them to make a run of three hundred, with the flexibility that we have, is impossible …they just can't move in, they can't react quickly enough …and our manufacturing processes are all very dynamic, it moves all the time, the target moves and we keep doing that.

There was also evidence of a strong personal inspiration from the MD and a supportive culture at the shop–floor level, as reflected in the following sample excerpts:

I think, for me personally, it's not money, it's not growing the wealth of the business. It's growing the business and seeing the satisfaction of making things that actually work better than competition.

Employees here get paid award rates, typically, including the manager. Nobody works here for money and there is enough overtime work …there is total honesty in this plant – it's always been like that for the last 10 years or so… Birthdays are remembered, we always have a lunch on birthdays.

Almost all the decisions were initiated by the MD and they were often discussed with the shop–floor staff, before making a commitment to implement them. Occasionally, external consultants were called upon to assist in addressing problems of strategic significance such as conducting audits. At least, in two occasions the shop–floor staff and an external consultant had either initiated or reinforced the initiatives through first raising the issues with the MD. The initiatives were finally confirmed by way of the MD's decision to commit resources towards the realisation of the same. The realisation of initiatives was primarily through actioning with heavy involvement of the shop–floor and/or administrative staff where parts of the work were often undertaken by a third party (external service providers). Most strategic initiatives also required contributions from a large section of staff. The progression of selected major strategic initiatives is presented in the following data display (Figure 4.19).

WHO?

MD: initiation

Other Staff: inputs

Other Staff: inputs

Managing Director: initiation; actioning

Other Staff: contribution

Managing Director: initiation; commitment

External Consultant: strategic audit

Other Staff: facilitation

Managing Director: initiation

External Consultant: strategic review

WHY?

Gain control over operations

Need to grow
MD' ambition
Resource constraints

Lack of capacity
Lack of growth

Room for new plant/machinery

Capital constraints
Resource constraints

Lack of growth

HOW?

Engage external consultant

Review and change of product mix, process span, product designs, manufacturing processes [incremental]

Audit/diagnosis

Capital investment decision

Contractor implement

Strategic review
Re–organisation of operations/business
Hiring new staff

WHAT?

Change of Ownership [Key Event]

ISO certification

Refocus business [strategic re–direction]

Purchase new plant/machinery [process/technology upgrade]

Relocate to new site/premises

Grow into full–scale manufacturing?

WHEN?

| 1992 – 1993 | 1995 | 1998 – 1999 | 2003-beyond |

Figure 4.19: Strategy Process Map for Machineco

4.9.3. Summary of Machineco Findings

Machineco's product–based growth reflected a clear pattern in decision–making and action–taking in such areas as capital investments, facility location, plant and equipment and/or technology upgrade and vertical integration. Almost all strategic decisions were initiated by the MD and were strongly influenced by his personal aspirations and the interpretation of the impact of market forces (based on his first hand experience and/or knowledge of the market dynamics). New product ideas generated on the shop–floor and nurtured by the cohesive culture were also found to have shaped the company's product–market strategy to some extent.

The initiatives were consolidated through discussions with shop–floor staff culminating in the MD's affirmation to commit resources towards the realisation of the same. The realisation of initiatives was primarily through actioning with heavy involvement of shop–floor staff where parts of the work were undertaken by external service providers. All strategic initiatives, once consolidated, were embraced by the rest of the staff and were realised through efforts of everyone. This pattern of strategy formation was nurtured by the cohesive organisational culture and the leadership style.

Irrespective of the size and significance of the initiatives, they were all discussed with the shop–floor staff from the outset. Often, they were consolidated with inputs from technical staff that had the expertise in relevant areas before being finally accepted as viable initiatives to be pursued by the company. Resource commitments were naturally in the form of affirmations by the MD. However, on occasions, he has sought external help in the form of diagnosis so as to ascertain the viability and feasibility of those initiatives, whenever he felt that they were beyond his intuitive judgment.

The majority of the initiatives were treated at the same level of prominence in terms of size of investment, strategic impact and the attention paid to by the MD and the staff. The entrepreneurial ideas or growth–based needs were often evaluated in detail before resource commitments were made, but there was no evidence to confirm a high degree of procedural rationality in the overall strategy formation process which is depicted in the following data display (Figure 4.20).
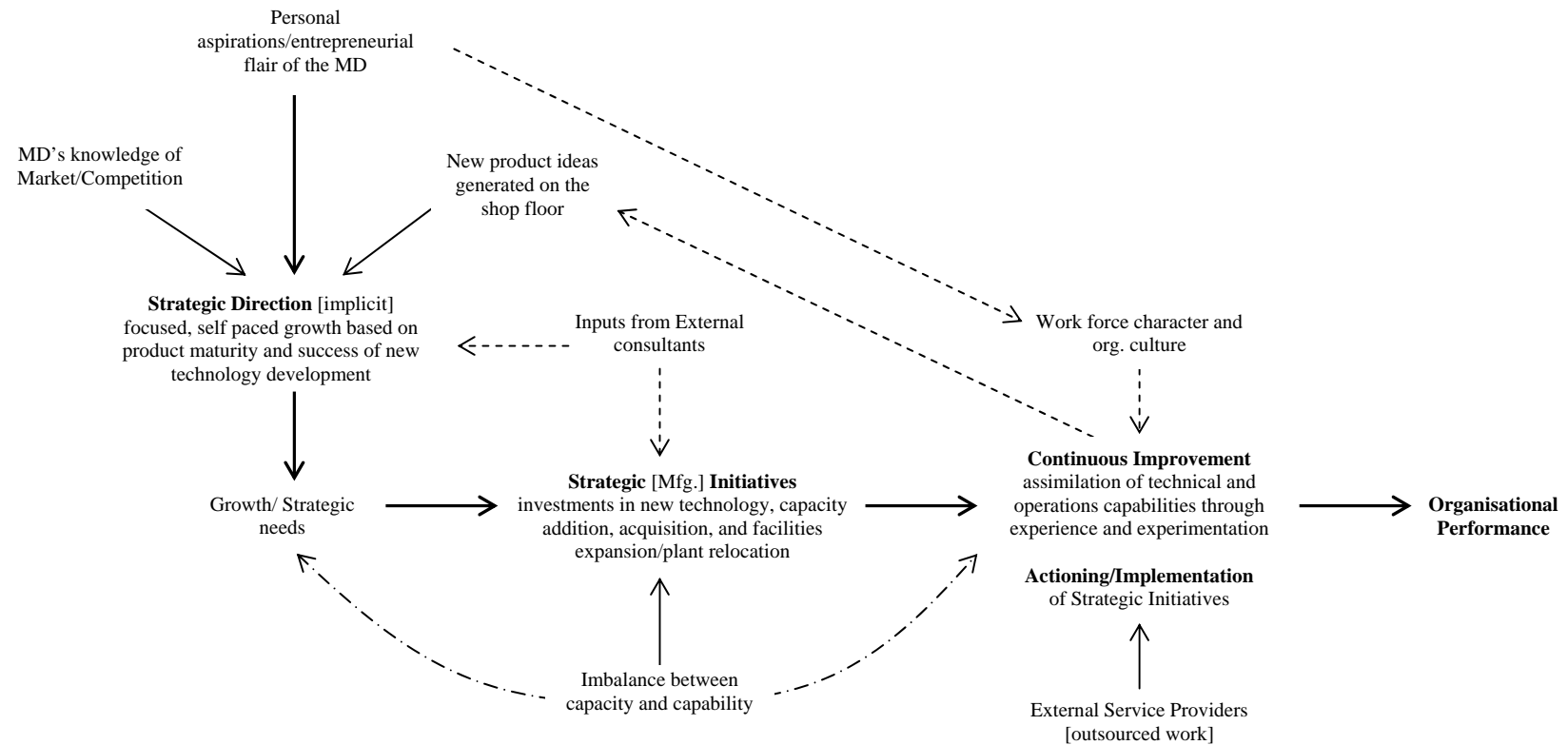
Figure 4.20: Strategic Decision Process for Machineco

The diagram contains the following elements:

- Personal aspirations/entrepreneurial flair of the MD
- MD's knowledge of Market/Competition
- New product ideas generated on the shop floor
- **Strategic Direction** [implicit] focused, self paced growth based on product maturity and success of new technology development
- Inputs from External consultants
- Work force character and org. culture
- Growth/ Strategic needs
- **Strategic** [Mfg.] **Initiatives** investments in new technology, capacity addition, acquisition, and facilities expansion/plant relocation
- **Continuous Improvement** assimilation of technical and operations capabilities through experience and experimentation
- **Organisational Performance**
- **Actioning/Implementation** of Strategic Initiatives
- Imbalance between capacity and capability
- External Service Providers [outsourced work]

161

4.10. Ventico B

This case included two extended interviews (up to two and a half hours duration) conducted with the managing director (MD) and a short interview with the general manager (GM) over a period of three months. The first interview with the MD was recorded and transcribed into text whereas notes were taken during the other two interviews. These interviews mainly focused on five key initiatives of strategic significance that had taken place over a period of three years. The final interview was also used to clarify and confirm the data displays developed based on the previous interviews. No documents were available for scrutiny.

4.10.1. Company Background

Ventico B is a small (micro) privately–owned Australia–based business operating in the machinery and equipment manufacturing and building services sectors. The company which had been operating in the building services industry for over fifteen years as a design/construction service provider had recently acquired another long–standing small manufacturing business. Over the past two years, subsequent to a major dispute with a client, the company has been experiencing severe cash–flow problems followed by significant changes at both strategic and operational levels. Ventico B has demonstrated its ability to capitalise on its technological know–how and continues to explore new business opportunities. It currently employs thirteen full time staff with annual revenue of just over $2 million. Ventico B is currently supplying to the Australian market only, but has ambitious plans for exporting to overseas markets.

The company operates in an industry sector which is highly competitive and served by a number of local and overseas suppliers. However, Ventico B serves a niche market segment within this industry, and therefore, aims at avoiding head–on competition against the major multinational players that compete based on low cost, Asia–based manufacturing. Its product–market strategy reflected a growth pattern (constrained by cash flow difficulties in the short–term) in those niche market segments that rival large multinationals cannot compete successfully mainly due to their lack of flexibility and the fact that they are located away from the local market (longer delivery lead times).

As such, the company's competitive strengths are design engineering know–how, innovation and the flexibility associated with its product/service offerings. Innovative application engineering solutions are at the heart of its operations. The entrepreneurial leadership coupled with its manufacturing (technical) expertise has placed the company on a sound platform upon which it could grow further as a successful business, although the manufacturing structure and infrastructure needed to support such an approach is not currently possessed by the company.

Production processes used were mainly of job shop and small batch type. The company's product development and manufacturing capacity have, in recent times, been severely impaired by its cash–flow problems and workforce related issues. However, the MD believed that, with its patentable technologies and the ability to offer innovative product/service solutions, they are well–positioned to enter the international market if it had the financial capacity needed to grow on that scale.

4.10.2. Data Analysis and Display (Case Narrative)

Ventico B, as a small company serving a niche market, has been striving to leverage on its strengths in offering customised solutions to commercial customers with a level of flexibility that cannot be easily matched by large multinationals. The essence of its overall strategic direction was captured in the following interview excerpt:

> We both (MD and GM) want to be bigger, we both want to see the niche of
> market protected and grow and we both want to see the efficiency in how
> we do things at the manufacturing level and all the way up to the office,
> from engineering to purchasing to the delivery of products to the floor.

As such, the competitive advantage came from its design and engineering capabilities, the flexibility to offer customised products and superior customer service. However, the company's strategic moves have been largely constrained by the unstable and difficult circumstances prevailing at the time. For instance, the status of manufacturing which the MD called "an extreme lean operation" had, to a large extent, been determined by the circumstances rather than by choice.

The rich interaction between the MD and the GM who had complementary strengths on the basis of their professional backgrounds and strong personal attributes provided the basis for rigorous, though not necessarily formal, analysis of issues, problems and opportunities in a real world context. The MD being a design engineer by profession provided analytical skills along with a flair for innovation and a strong desire to succeed. The GM with his extensive experience as a manufacturing engineer and an entrepreneur provided the manufacturing know–how and a range of skills needed to successfully run a business. These aspects are reflected in the following excerpt:

> I am the person who brings in innovation and ideas. He is more focused on manufacturing expertise and technical expertise on the manufacturing side. Again, me being analytical and he being whoever he is with his rich experience in manufacturing, we seem sort of to work well and we understand which way we need to go.

At Ventico B, new ideas often emerge at the senior management level. They came in varying forms; solving workforce issues, new product ideas, market opportunities and process improvements as reflected in the following excerpt:

> So, in that respect, we sit there and we diagnose problems and difficulties. And really that happens on the need basis, some weeks we talk every day, others it might happen once a week or whatever, try to discuss problems and strategies and ideas and the likes.

The type of ideas contemplated and the initiatives examined varied from incremental improvements in production processes through addressing key workforce issues to exploring new business opportunities such as partnering with overseas manufacturers. Irrespective of the type and the nature of the initiatives, they were all comprehensively reviewed by both the MD and the GM. These reviews often led to testing of new ideas on a pilot scale for their viability, suitability and effectiveness before making a final commitment. Resources were then committed to those initiatives that had demonstrated the potential to bring in tangible benefits to the business, especially those that could enhance the bottom–line performance of the company. The key process attributes of the major initiatives studied are presented in Figure 4.21.

WHO?	GM: Initiation; implementation MD: Agreement		MD: initiation; actioning GM: contribution	MD: initiation Other staff: execution	MD: initiation; actioning GM: input; actioning	MD: initiation; actioning GM: ideas; technical inputs
WHY?	Reduce inventory Improve capacity utilisation Other cost savings		Cash flow problems	Litigation costs Loss of income Cash flow problems	Improve productivity Improve morale Address workforce issues	Alternative business opportunities Entrepreneurial aspirations
HOW?	Review current product line Develop new quotes Introduce new product line		Assess situation Pursue legal action Scale-down business Improve efficiency Explore new opportunities	No new contracts pursued Terminate excess staff	Redistribute work Cross–train workers Instil discipline through direct involvement	Govt. grant New technology development Visits/MOU Negotiations
WHAT?	Reconfiguration of the product line	Major payment dispute with a client: $1m [Key Event]	Strategic review of the business	Scale down operations of the sister business	Re-organise work systems	Partner with overseas manufacturer Access to new market/contract
WHEN?			←——————————— 3–YEARS ———————————→			

Figure 4.21: Strategy Process Map for Ventico B

165

Most of the initiatives were realised through actions taken by either the GM or the MD that flowed through to the manufacturing floor. Sometimes, initiatives such as those aimed at productivity improvements were also carried out under the personal supervision of the MD. On other occasions, the more strategically significant initiatives such as negotiating with prospective business partners were pursued by the MD with limited direct involvement of the GM. The progression of selected strategic initiatives is shown in the data display above (Figure 4.21).

4.10.3. Summary of Ventico B Findings

With no explicit strategy at any level of the business, Ventico B's innovation–based growth that had,, in recent times, been conditioned by the short term cash–flow and operational problems reflected consistent patterns in decision–making and action–taking in such areas as vertical integration, capital investments, workforce issues and performance improvements. Almost all initiatives were pursued by the MD and were observed to have been strongly influenced by his personal aspirations/ambitions and the technical expertise provided by the GM. New product and service ideas that were generated at the senior management level had shaped the company's product–market as well as the growth strategies to a significant extent.

Irrespective of the size and significance of the initiatives – in terms of resource commitments involved and/or their impact on the business – all of them were subject to comprehensive review by the MD and/or GM from the outset. Often, they were consolidated with technical inputs from the GM who had extensive experience in manufacturing. The MD himself being a professional in the area was in a strong position to communicate with the GM on technical issues. Resource commitments were always in the form of affirmations by the MD. The realisation of initiatives was primarily through implementation and actioning by the senior management with the involvement of shop–floor staff. Organisational culture and management style were observed to be two other important factors that influenced the operations of the business. The overall process of decision–making and action–taking is depicted in the following data display (Figure 4.22).

MD's Personal
aspirations/desire to grow

MD's Design expertise
and knowledge of
Market/Competition

GM's experience
and Know-how

*Interaction between MD
and GM database*

Strategic Direction
[niche market; technology-based; low
investment; cash low focused]

Work force character and
org. culture

Major financial/cash
flow problems

Strategic goals and
operational needs

Strategic Initiatives
new technology development, product
line reconfiguration; efficiency
improvement; alternative business
opportunities

MD's Affirmation

Actioning/Implementation
of Strategic Initiatives
Continuous Improvement
assimilation of technical capabilities
through experimentation

**Organisational
Performance**

Operational problems;
improvement initiatives

Figure 4.22: Strategic (Manufacturing) Decision Process for Ventico B

4.11. Chapter Summary

This chapter constructed within–case patterns of strategic decision–making and action–taking for all nine case companies studied. The iterative process of data collection and analysis employed in this study facilitated the progressive development of exploratory accounts via mainly descriptive and, to a lesser extent, inferential coding of interview transcripts/write-ups. The case narratives were supplemented with the two main types of data displays – process maps and causal networks – along with direct text support where appropriate. The uniform format followed in the data analysis and the presentation of findings allowed the explication of recurrent within–case patterns that further facilitate cross–case comparisons (undertaken in Chapter 5).

The within–case patterns of strategic decision–making and action–taking were found to be broadly consistent across cases. The recurrent patterns at the single case–level were explicated in terms of major process elements, causal links, key actors involved and the influencing factors/forces. The type of decisions and actions that fell within the domain of manufacturing, as revealed by the participants, was also found to be broadly consistent across cases. In addition, a number of other parameters of interest and their likely influence on strategy formation were revealed through the interviews. These parameters include organisational culture, the influence of top management, the expectations of junior management and the personal aspirations of senior management, as well as some unintended consequences of top management's actions and decisions.

Moreover, there were a number of differences across cases which could be explained using certain contextual factors examined in the study. The major differences include the degree of procedural rationality reflected in the strategy process, the role of actors involved in the process, the source of initiation of strategic actions and decisions and the temporal dimension of the process. The range of contextual factors emerged through the interviews include organisational culture, the influence of unions and the leadership style of the top management, as well as the product–market, economic and regulatory aspects. A comprehensive analysis of across–case differences and similarities along with the resultant findings is presented in the following chapter.

CHAPTER 5: ACROSS–CASE DATA ANALYSIS AND FINDINGS

5.1. Introduction

This chapter interrogates and aggregates the mainly text–based data collected in this study in order to identify recurrent patterns in strategic decision–making and action–taking, as well as any higher–order themes across the cases. It also compares and contrasts the within–case patterns constructed in the preceding chapter within their broader organisational contexts, with a view to advancing causal understanding. These themes and more abstract patterns, in turn, are used in developing a conceptual model reflecting deeper structures of strategy formation.

As stated in Chapter 3, the case companies for this study were chosen based on purposive and theoretical sampling, as opposed to statistical or random sampling. Theoretical sampling allows data reduction from the outset, whereas purposive sampling helps control certain parameters of interest through the judicious selection of cases to support both theoretical and literal replication. Primarily, purposive sampling was used to control the parameters of interest identified as internal and external contextual factors, with a view to understanding and explaining possible across–case patterns. The key internal organisational contextual factors included the structure, size and ownership of the firm, the stage of firm development (maturity), organisational culture and/or workforce character and the managerial/leadership style. The key external contextual factors included competitive rivalry and market conditions.

The conceptual framework – developed based on the literature review – informed the sources and types of data to be gathered and the extent of detail to be sought in exploring the key parameters of interest. The broad process attributes were identified as initiation, participation, progression and realisation. Accordingly, the interview protocol was designed to extract as much detail as possible on these aspects, leaving information relating to other parameters such as contextual factors and performance measures to emerge in the course of interviews. Archive/document analysis was also used to supplement and corroborate interview data as appropriate and where available.

5.2. The Organisational Contextual Factors

Based on the analysis of interview data and the company documents, the internal and external organisational contextual factors applicable to each company were subjectively assessed using the following rankings (Table 5.1). These rankings were compiled based on those widely used in previous strategy process research.

Table 5.1: Internal and External Organisational Contextual Factors

Organisational contextual factors	**Internal**	**Firm size**	Micro
			Small
			Medium
			Large
		Ownership	Publicly Listed
			Privately owned (not listed)
			Owner–managed
		Organisational structure	Mechanistic/Hierarchical
			Organic/Team–based
		Maturity [stage of firm development]	Growing
			Consolidating
			Established
			Pioneering
		Organisational culture Workforce character	Cohesive–flexible
			Adversarial–entrenched
		Managerial/leadership style	Authoritative
			Consensual
	External	**Competitive rivalry**	High
			Moderate
			Low
		Market conditions	Stable
			Volatile

All nine cases were chosen to represent the metal products manufacturing (Subdivision 27) and machinery and equipment manufacturing (Subdivision 28) of the 1993 Australian and New Zealand Standard Industrial Classification (ANSZIC) Division C, manufacturing sector. As such, they represented a fairly homogeneous sample in terms of the manufacturing processes employed. The key parameters of interest relating to the selected organisational contextual factors are summarised in Table 5.2 below.

Table 5.2: The Profile of Case Companies

Parameter of Interest	Case Company								
	Large		Medium		Small			Micro	
	Electrico	**Metalco A**	**Metalco B**	**Metalco C**	**Technico**	**Ventico A**	**Tronicsco**	**Machineco**	**Ventico B**
Sales turnover (AUS $) ~	10 billion	8 billion	120 million	500 million	60 million	50 million	60 million	1–2 million	2–3 million
Number of employees ~	Withheld for confidentiality	Withheld for confidentiality	500	2000	180	100	150	9	13 (30)
Ownership	Listed; (subsidiary of) multinational	Listed; large Australia–based	Listed; Australia–based	Privately owned; Australia–based	Privately owned; Australia–based	Privately owned; Australia–based	Privately owned; Australia–based	Owner–managed; Australia–based	Owner–managed; Australia-based
Stage of firm development	Pioneering	Pioneering	Established	Established	Consolidating–established	Established	Established	Growing–consolidating	Growing–consolidating
Organisational structure	Functionally organised, hierarchical with matrix	Geographically based, market specific; hierarchical	Functional/ geographically based hierarchical	Functional/ geographically based hierarchical	Functionally organised team-based	Functionally organised hierarchical	Functionally organised team-based with project	One small team [functionally based]	Small work groups [functionally based]
Major product line	Electrical Systems	Building (metal) products	Building (metal) products	Building (metal) products	Computer/ IT solutions	Building service products	Electronic equipment	Machinery/ equipment	Building service products
Manufacturing processes	Small batch/assembly	Batch/assembly	Small batch	Small batch	Small batch/assembly	Small batch/assembly	Batch/assembly	Small batch/engineered	Assembled to order
Management style	Authoritative	Authoritative	Authoritative	Authoritative	Consensual	Consensual	Authoritative	Consensual	Authoritative
Market/ Competition	Local/Global	Global/Global	Local + limited overseas/Local	Local/Local	Local + limited overseas/Global	Local/Global	Global/Global	Local (niche)/Global	Local (niche)/Global
Market conditions	Stable; slow growth	Stable; moderate growth	Stable; slow growth	Stable; slow growth	Volatile; medium growth	Stable; slow growth	Volatile; medium growth	Stable; slow growth	Volatile; slow growth
Industry rivalry	High	Moderate	Moderate–High	Moderate–High	Moderate	High	High	Low	Low

5.3. Across–case Patterns of Strategy Formation

This study was informed by the existing knowledge relating to the alternative conceptualisations of strategy formation and various elements of strategy processes, as well as some tentative relationships among those elements. It also acknowledged, upfront, the influence of a number of internal and external organisational contextual factors on strategy formation processes. This prior knowledge and understanding, developed through the literature review, was used in developing a provisional list of descriptive codes to organise text–based data. It also helped shape some interview questions used in the later part of data collection. As the study progressed, these codes were retained, modified or discarded, depending on their fit with the actual data collected and as informed by the increasing understanding developed though the ongoing analysis of data. New codes were also added to the list, as required, based on the early explorations.

The start (provisional) list of codes is provided in Appendix 2A. The final list of codes that was created using the NVivo (software) is provided in Appendix 2B. A selection of descriptive and inferential codes used in establishing the key process attributes, along with sample text descriptors are provided (below) for illustrative purposes.

Strategy Initiation:

Actor–specific (source)
Supervisory Staff
Other Management Staff
Manufacturing Manager
Marketing Manager
General Manager

Cause–specific (stimuli)
Technology–driven
Regulatory Requirement
Operational Problems
Improvement Needs
Growth–based
Event–triggered
Entrepreneurially driven
Directives from the Top Management
Competitive Pressure

Text descriptors for actor–specific codes: initiated/proposed by; idea/intention of; wanted/asked/advised/was instructed by; I wanted/decided/asked/was instructed to.

Text descriptors for cause–specific codes: to address/overcome (issues, problems etc.); to improve/enhance (skills, capabilities etc.); in support of (other initiatives etc.); in response to/as a reaction to (events, forces etc.); to satisfy/comply with (needs/ requirements etc.) to carry out/implement (directives, instructions etc.).

Participation in Strategy Process:

Actor–specific	*Role–specific*
Supervisory Staff	Ruling
Sales/Marketing Management	Reviewing
Other Staff	Resistance
Other Management	Implementation
Manufacturing Manager	Facilitation
General Manager	Execution
External Party	Authorisation
Board of Directors	Actioning

Text descriptors for actor–specific and role–specific codes: assessed/reviewed by; approved/authorised by; consent/agreement of; assessment/judgment/ruling of; agreement/resistance from; implemented/carried out/actioned by; a study by.

Progression of Initiatives: negotiation; consensus; evolution; enforcement; authorisation; affirmation.

The progression of strategic initiatives was represented by sequences of events, actions and decisions and changes in the status of an event, action or decision over time, including iterations and periods of inaction.

Text descriptors for codes indicative of progression: assessed; discussed; analysed; activated; formulated; reviewed; committed; approved; agreed; authorised; affirmed; made; decided.

Realisation of Strategy: implementation; execution; actioning.

Text descriptors for codes indicative of realisation: implemented, project–managed, actioned, carried out.

Elements of MS Process: strategic initiatives; strategic events; strategic decisions; strategic actions; action plans; measures; strategies.

Text descriptors for codes indicative of process elements: events; actions; decisions; activities; action plans; intentions; reactions; responses; influences; instructions; practices; procedures.

Across–case patterns were established based on the descriptive and inferential codes which were consistently appearing in more than one case, recurring sequences in the progression of initiatives, actions and decisions across cases and the thematic statements drawn across cases such as those cited below.

> We don't really have an individual acceptable manufacturing strategy. We have an overall scope of strategy.

> Even if you have the numbers it's not completely objective, because in any business case there are a lot of assumptions.

> The longest time frame that we are working on is twelve months – no five–year plans – really the working time frame is three to six months.

> It's really intuitive, there is no formal process there, and it's more a case of cumulative learning … and more or less casual.

> The decision to move to this site was by necessity, not by great planning.

> There is no major decision–making process, people have a rough guide. It's a bit of gut–feel …it's pretty hard to get factual information on the system.

> Decision–making is more or less informal or ad–hoc.

The above statements and many others across all nine cases captured the predominantly informal aspects of strategy processes. Manufacturing Strategy (MS) literature has often referred to "formal" and "informal" aspects when describing MS processes, but there appear to be no widely accepted criteria for differentiating between the two. Within the context of this study, formality is interpreted with connotations of objectivity, comprehensiveness and the systematic nature of decision–making and action–taking (procedural rationality).

The vast majority of the case companies studied demonstrated predominantly informal MS processes. The two large firms Electrico and Metalco A had formal strategic planning processes in recoded form at the SBU level, but their strategic manufacturing decisions and actions, most of the time, were not subject to detailed economic and/or quantitative analysis, or evaluation. Most of the case companies studied used some form of quantitative data to justify major investment decisions. Overall, the patterns in strategic decisions and actions confirmed that MS formation consists of both formal and informal elements, with the larger organisations displaying a higher degree of procedural rationality. However, the extrapolation of this rationality beyond the specific sample of case companies examined may require further analysis and/or investigation.

In addressing the first research question, this study took a broad approach. Based on the limited knowledge and understanding developed through the literature review, it envisaged possible ways of arriving at competitive priorities and formulated the interview questions to explore those possibilities. For example, the participants were asked to comment on the basis of competition for their major product lines and to elaborate/explain the ways in which they determine that basis of competition. Although such questions did extend beyond the scope of the study by touching on the aspects of strategy content, that was considered necessary in order to maintain the flow of information and to understand the process aspects in perspective. Other questions that aimed at exploring the inputs to the strategy process and the initiation of strategic decisions and actions, including the cause–specific and role–specific aspects, were then used to build a more complete picture of the ways in which competitive priorities were arrived at, and translated into, strategic actions and decisions.

The bases of competition that emerged through the interviews were broadly consistent across the nine cases, as well as with what was found in strategy literature. Cost and quality were quite straightforward dimensions, although differentiation at the level of order qualifiers and order winners was not directly evident in the participants' responses. Service and flexibility were interpreted in quite diverse ways. For example, customer service was explained in terms of product availability (fill–rate), on–time delivery and convenience (delivery flexibility), whereas flexibility was interpreted with regard to delivery time, product features (customisation) and order size (volume). Innovation was interpreted with connotations of the technical capabilities of products, design capability of the organisation and customer–focused product features.

Competitive priorities, which were found to be product–market specific, were arrived at based on the company's overall strategic direction, profit goals and product–market strategies, while taking the market needs and competitor movements into account. To a significant extent, they were shaped by the top management's intuitive judgement and their entrepreneurial instinct, as well as their personal aspirations.

The process of translating competitive priorities into strategic decisions and actions involved managerial interpretation, assessment/evaluation and intuitive judgement. If there was a formally recognised or agreed upon set of competitive priorities, they were interpreted in terms of what they meant for manufacturing. When competitive priorities were implicitly recognised, their translation into strategic decisions and actions were often subject to the intuitive judgement of individual actors involved. However, strategic decisions and actions were not always derived from competitive priorities, as a number of other stimuli were found to be associated with strategic initiatives in the form of catalysts, triggers, forces, problems and needs. All strategic decisions and actions examined were initiated at the management/supervisory level, except for a few small–scale initiatives that were triggered by the shop–floor staff and external consultants. The ways in which competitive priorities were arrived at and translated into strategic decisions and actions, as established based on the across–case patterns, are schematically represented in the following data display (Figure 5.1).

Top Managements Insights/Inputs

Competitor Behaviour
Short-term changes in
product–market conditions

**Product–Market
Goals
Profit Goals**

**Strategic Direction
Business Strategy**
Growth; expansion;
integration;

Competitive Priorities
Cost; Quality; Delivery;
Flexibility; Service;
Innovation

Major Strategic (mfg) Initiatives
Significant Investments in manufacturing
structure and infrastructure; major
improvement initiatives

**(Manufacturing)
Capabilities**

Other Strategic (mfg) Initiatives
Small scale investments in
manufacturing structure and
infrastructure; improvement initiatives

**Operational Problems/Issues
Improvement Needs**
Workforce issues; skills &
capabilities; performance related
problems;

→ **Main driving force/causal link**

→ **Secondary force/influence (double arrow–interactive)**

- - - -> **Performance feedback**

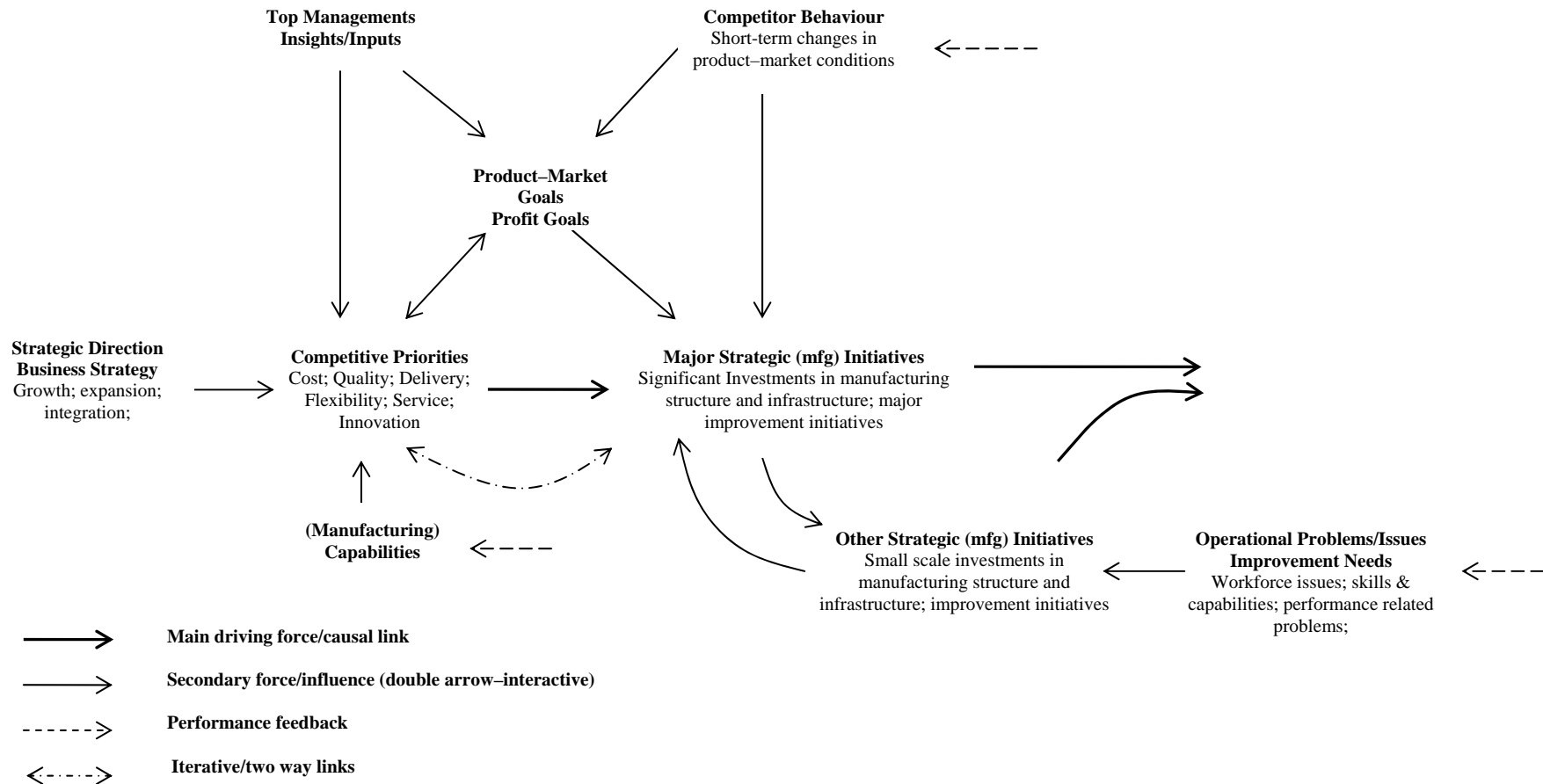<- - · - -> **Iterative/two way links**

Figure 5.1: Across–case Patterns of Strategy Initiation

177

The range of actors involved in strategy initiation included the CEO and the senior management of the parent company or the group/divisional unit (in the case of multi–SBU organisations), top management (in the case of single–SBU organisations), the General Manager (GM) of the business unit, senior management of the SBU and/or parent company, functional heads, department managers, technical specialists and the supervisory–level staff.

The range of stimuli for strategy initiation included parent company directives, top management's initiatives, ad–hoc reactions to competitor behaviour/market pressure, regulatory compliance, specific events, prior (and often more substantial) initiatives, new technology, growth–based needs, operational problems, improvement needs and entrepreneurial/intrapreneurial insights.

Initiatives that emerged as above were observed to have progressed until they were realised through specific actions of the lower–level management and other staff, unless they were rejected or put on hold for some reason. For instance, a decision by the manufacturing manager to purchase a new piece of equipment could be developed into a formal capital proposal with the input of some other department managers, such as Engineering Manager and Research & Development Manager, before being presented to the GM or the Board of Directors for formal authorisation. In contrast, some other initiatives that did not require significant capital outlays, such as small–scale process improvements, were actioned with the informal consent of the higher management.

Strategic initiatives that progressed as above were realised through more formal implementation or project management mechanisms, in relatively informal forms through actions of lower–level management and supervisory staff, or were carried out by senior management as per the directives from the top management. Realisation of strategic initiatives, in some instances, was met with resistance from the workforce and unanticipated technical/resources problems, resulting in interruptions/interventions by external parties, leading to delays and less–successful outcomes. Forty–seven strategic initiatives examined across all nine case companies were observed to have progressed along several different paths, as schematically shown in Figure 5.2.

Path - I

Path - II

Path - III

D	Put on Hold		Rejected/Returned	X	Resistance/Other Issues	O	Iteration

Figure 5.2: Paths of Progression of Strategic Initiatives

179

Initiated by Top Mgr (GM/MD/CEO) ——— Resource allocation

Carried out by Senior
Mgr + other mgmt/staff

Path - IV

Agreed by top mgr (GM/MD/CEO) ——— Resource allocation/commitment

Initiated by Senior/Dept Mgr

Implemented/actioned by Senior/Dept
Mgr + supervisory staff

Path - V

Agreed by Dept/Senior Mgr ——— Resource commitment

Initiated by Supervisory Staff

Actioned by supervisory staff

Path - VI

D Put on Hold　　　Rejected/Returned　　　X Resistance/Other Issues　　　○ Iteration

Figure 5.2: Paths of Progression of Strategic Initiatives (Contd.)

These across–case patterns reveal that the majority of strategic initiatives are first consolidated through such informal means as review/discussion at senior management level, discussion and agreement at the department managers' level, or more formal mechanisms such as peer–review and appraisal of capital/project proposals. However, a number of other initiatives progressed on the fringes of this consolidation process. For instance, some decisions by the top management were imposed on senior management, while other small–scale initiatives by department managers and supervisory staff were actioned with the informal agreement/consent of higher management. The participants' accounts suggested that this consolidation process was far from being comprehensive and rational (in relation to economic models) but it was structured in the sense that each organisation displayed a rather consistent approach to dealing with issues of similar type. For example, in the majority of cases, major investment initiatives were evaluated against their impact on the business with regard to an agreed set of objectives, including financial, operational and market–related deliverables. The mechanisms included intuitive judgements/gut feelings of the top management, a majority view supporting the merits (or otherwise) of a 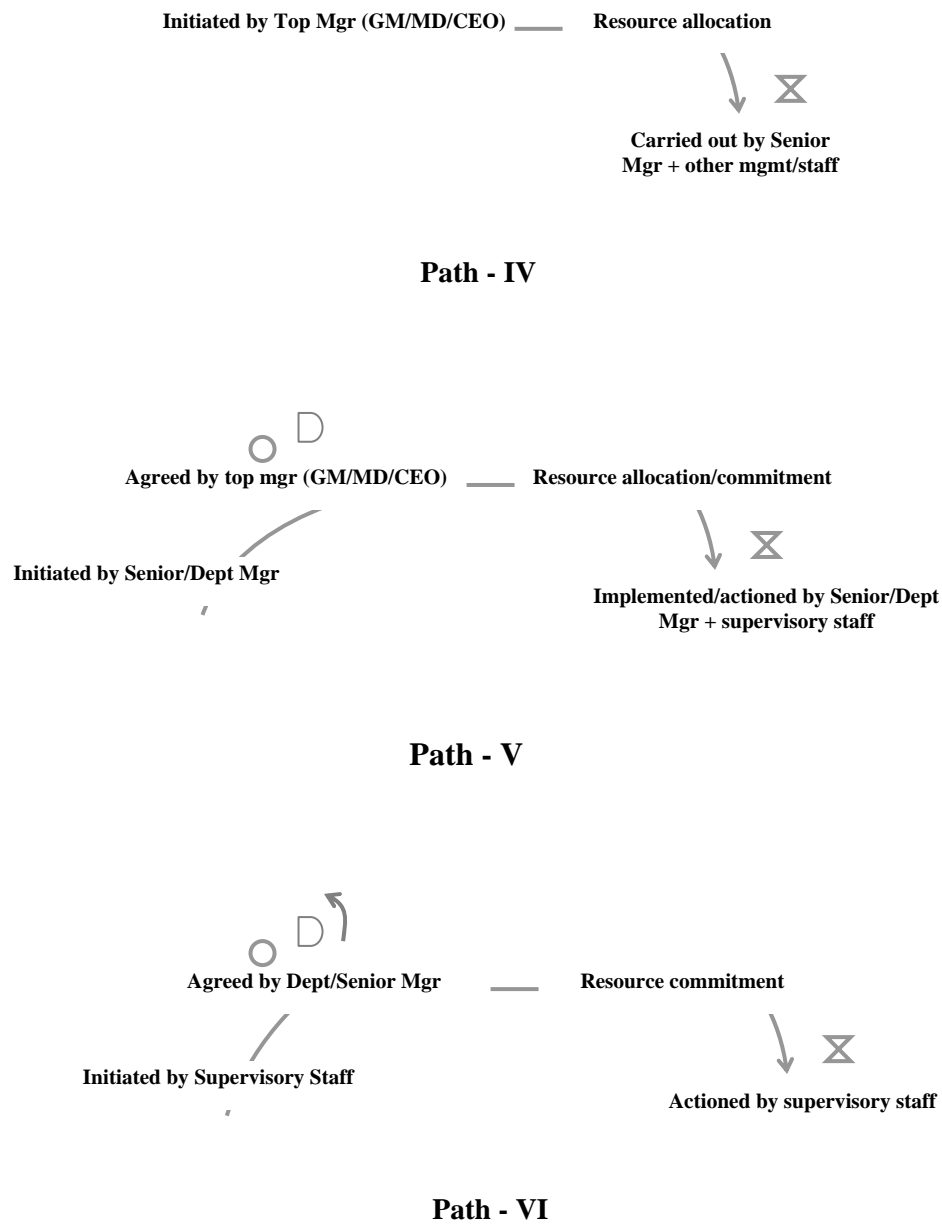particular initiative and appraisal of formal project/capital proposals. However, as the research design did not facilitate the investigation of the cognitive aspects of decision making at the individual–actor level, it was not able to establish further details of this process.

Initiatives consolidated as above were often formally or informally authorised by the higher management, depending on their significance. Furthermore, this confirmed the allocation/commitment of resources for the initiatives to proceed towards realisation. Thus, the progression of initiatives displayed two distinct phases; consolidation and commitment. There was also some evidence to suggest that some initiatives did not always emerge as ready–made options, but had evolved over a period of time, but this study did not opt to investigate the dynamics of such aspects.

Overall, the across–case patterns presented above explicate the ways in which the competitive priorities are arrived at and translated into strategic decisions and actions, as aggregated in the form of four inferential codes – **initiation**, **consolidation**, **commitment** and **realisation**, and they satisfy the first research question. In addition, these patterns provide the basis for addressing the second research question.

5.4. Phases and Multiple Progressions in Strategy Formation

These findings suggest that strategy formation consists of rather non–linear processes, but can be conceptualised, at a more aggregated level, in terms of four discernible phases identified as initiation, consolidation, commitment and realisation. The labels used are consistent with both the process parameters established through the literature review (that is, reflecting current understanding) and the patterns which emerged through the interview transcripts as above (that is, grounded in empirical data). These phases reflect their characteristic process dynamics in contrast to the cognitive patterns of "information seeking–information processing–evaluation" used in many previous strategy process studies that have focused on individual decisions.

Furthermore, the inferential codes which emerged in the analysis suggest that the multiple stimuli/sources of initiation, alternative paths of consolidation and differing forms of commitment and realisation observed within each phase can be classed as specific modes within phases as shown in the following matrix (Table 5.3).

Table 5.3: Inferential Codes Indicative of Modes within Phases

INITIATION	CONSOLIDATION	COMMITMENT	REALISATION
FORCED: *Parent company directives* *Top managers' initiatives* *Reactions to competition* *Regulatory compliance*	*ENFORCED:* *Adaptation* *Charismatic* *Position power*	*AUTHORISATION:* *Based on formal authority* *Confirmation of dominant view*	*EXECUTION:* *Compliance* *(directives/rulings/forces)*
OPPORTUNISTIC: *Event triggered* *Technology-driven* *Market or customer-driven* *Entrepreneurially driven*	*NEGOTIATED:* *Political manoeuvring* *Balance of forces* *Rational choice*	*AFFIRMATION:* *Forced (circumstances)* *Voluntary (aspirations)*	*IMPLEMENTATION:* *Interpretative process*
EVOLUTIONARY: *Growth-based* *Improvement needs* *Operational problems* *Intrapreneurial behaviour* *Personal aspirations*	*CONSENSUS-BUILDING:* *Collective agreement* *Learning by doing*		*ACTIONING:* *Cumulative effect*

Initiatives that emerged as reactions to competitor moves, to comply with regulatory requirements, or as directives from the top management all displayed similarities with regard to the actors involved (often driven by the top management), the level of priority assigned, shorter time frames and speedier decision–making. Taking these characteristics into account, they were coded as "**forced**" initiations.

In contrast, initiatives that emerged as growth–based needs, solutions to operational problems, small–scale improvements and other decisions/actions initiated at the lower levels of management exhibited relatively low levels of priority, limited formal analysis, some resistance (on the shop–floor level), realisation through actioning and mixed durations. They were coded as "**evolutionary**" initiations.

In addition, a third group of initiatives displayed a number of similarities, including the financial commitments involved, their potential impact on the company's operations and the actors involved in their initiation (mostly senior managers). These initiatives were often driven by new technology developments, shifting market/customer requirements and intrapreneurial insights. They may also have been triggered by internal or external events, such as securing a major contract, restructuring of the organisation, financial situation of a business subject to acquisition (in such cases). Based on these characteristics, they were coded as "**opportunistic**" initiations.

Consolidation of initiatives displayed similarities across cases, some of which were also associated with the mode of initiation and the actors involved. For instance, the decisions and actions that were broadly identified as forced initiations were driven by the influence (charismatic or position power) of the top management and were associated with a high degree of urgency. Usually, they were not subject to detailed analysis or negotiation yet did not face much resistance. The resource commitments for these initiatives were swift and straightforward. The changes allowed in these initiatives were limited to adaptations (to suit local conditions) and minor adjustments (to facilitate realisation). Thus, this mode of consolidation consumed the shortest time. Taking these characteristics into account, it was coded as "**enforced**" consolidation.

The second mode of consolidation was characterised by more detailed analysis, use of quantitative data and agreements through debate and/or discussion, including some degree of political manoeuvring. The range of instruments used in this process included team discussions and reviews, appraisals, assessments/judgments by one or more actors, peer reviews, formal capital proposals and project proposals. This mode was the most comprehensive and structured form of consolidation with the longest duration. As such, it was coded as "**negotiated**" consolidation.

The third mode of consolidation, coded as "**consensus**" reflected low–profile consensus–building through more informal discussions and brainstorming at the lower levels of management, leading to the securing of resources required for the relatively small–scale investments and incremental improvement initiatives. Justification of resources for these initiatives was not sophisticated, although their progression was often subjected to competing priorities and the overall level of investment an organisation was willing to maintain at a given time.

The commitment of resources for initiatives was made either through formal "**authorisation**" at the top management and/or Board of Directors level or more subtle and informal "**affirmation**" at the lower levels of management within their budgetary provisions (depending on the size of financial commitment, delegation of financial authority and the size of the firm). The commitment to initiatives was operationalised through exercising of formal authority, confirmation of the dominant view (as emerged through team–based discussion/debate, reviews and assessments) and affirmations driven by the circumstances (forced), or personal aspirations and insights (voluntary).

The wide range of initiatives studied were found to have been realised through more formal "**implementation**" involving planned approaches such as project management, more informal "**actioning**" at individual and small group–level activities or in the form of "**execution**" (carrying out) of the directives and rulings of the internal and external authorities. On some occasions, external parties contributed to this process, with varying degrees of involvement.

In summary, the initiation phase (IN) was assigned with three modes: forced (FOR), opportunistic (OPP) and evolutionary (EVO), as was the consolidation phase (CD): enforcement (ENF), negotiation (NEG) and consensus (CON). The commitment phase (CM) displayed two key modes; authorisation (AUT) and affirmation (AFF) whereas the realisation phase (RL) was again in three modes: execution (EXE), implementation (IMP) and actioning (ACT).

The findings of the across–case analysis are synthesised in the following conceptual model (Figure 5.3), depicting the deeper structures of MS formation. They are intended to satisfy the first part of the second research question.

INITIATION	CONSOLIDATION	COMMITMENT	REALISATION

FORCED
Parent Co. directives
Top Mgr's initiatives
Reactions to competition
Regulatory compliance

OPPORTUNISTIC
Event-triggered
Technology-driven
Market/Customer-driven
Intrapreneurially driven

EVOLUTIONARY
Growth/Need-based
Entrepreneurially driven
Personal aspirations

ENFORCED
Charismatic
Position power

NEGOTIATED
Political manoeuvring
Balance of forces
Rational choice

CONSENSUS
Collective agreement
Learning by doing

AUTHORISATION
Formal authority

AUTHORISATION
Dominant forms

AFFIRMATION
Forced (circumstances)

AFFIRMATION
Voluntary (aspirations)

EXECUTION
Compliance

IMPLEMENTATION
Interpretative process

ACTIONING
Cumulative effect

Figure 5.3: Conceptual Model (Deeper Structures in Strategy Formation)

186

5.5. Causal Understanding of Patterns

The within–case and across–case patterns discussed so far, when combined with the contextual factors identified previously, provide the basis for causal understanding required in addressing the second part of the second research question – why do those patterns exist in that way?

Table 5.4: Core Patterns of Initiation, Progression and Realisation

1	IN-FOR	→	CD-ENF	→	CM-AUT	→	RL-EXE
2	IN-FOR / IN-OPP	→	CD-NEG	→	CM-AUT	→	RL-EXE / RL-IMP
3	IN-OPP	→	CD-NEG	→	CM-AUT	→	RL-IMP
4	IN-OPP / IN-EVO	→	CD-NEG	→	CM-AUT	→	RL-IMP
5	IN-OPP	→	CD-NEG	→	CM-AFF	→	RL-IMP / RL-ACT
6	IN-EVO	→	CD-NEG	→	CM-AUT	→	RL-IMP
7	IN-EVO	→	CD-CON	→	CM-AFF	→	RL-IMP / RL-ACT
8	IN-EVO	→	CD-CON	→	CM-AFF	→	RL-ACT

The forms of MS formation are embodied in the core patterns of initiation, progression and realisation, as listed in Table 5.4 (these patterns are to be read in conjunction with Figure 5.3). A complete list of the 47 strategic decisions and/or actions examined in this study, along with their representative modes of initiation, consolidation, commitment and realisation are provided in Table 5.5 below.

Table 5.5: Decision/Action Matrix

Initiative	Case	Strategic Initiative	Initiation [Source/Stimuli]	Consolidation	Commitment	Realisation	Path
1	Electrico	**Relocate plant**	Evolutionary [growth/need-based] Senior mgr	Negotiation [rational choice)	Authorisation [dominant form]	Implementation	6
2		**Restructure organisation**	Forced [top mgmt initiative] Opportunistic (event-triggered)	Negotiation [dominant form]	Authorisation [formal authority]	Execution Implementation	2
3		**Review product line**	Opportunistic [event-triggered] Senior mgr	Negotiation [rational choice]	Affirmation [forced]	Implementation	5
4	Metalco A	**Review viability of overseas operation**	Forced [top mgmt initiative] Opportunistic [event-triggered] Evolutionary [Need-based]	Enforcement [Position power]	Authorisation [formal authority]	Execution Implementation	1
5		**Invest in new process (production) line**	Opportunistic [entrepreneurially/market-driven] Senior mgr	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	3
6		**Acquire another business**	Forced [Top mgmt] Opportunistic [event-triggered; entrepreneurially driven]	Negotiation [balance of forces]	Authorisation [dominant form]	Execution Implementation	2
7		**Invest in plant/facility upgrade**	Opportunistic [technology-driven] Senior mgr	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	3
8	Metalco B	**Change production mgmt approach**	Forced [reactions to competition] Top Mgr	Enforcement [position power]	Authorisation [formal authority]	Execution	1
9		**Reduce set-up time**	Opportunistic [event-triggered] Senior mgr	Negotiation [rational choice]	Affirmation [forced]	Implementation Actioning	5
10		**Reduce scrap rate**	Opportunistic [event-triggered] Senior mgr	Negotiation [rational choice]	Affirmation [forced]	Implementation Actioning	5
11		**Purchase tooling**	Opportunistic [event-triggered] Senior mgr	Negotiation [rational choice]	Authorisation [dominant form]	Implementation	3
12		**Re-design work system**	Opportunistic [event-triggered] Evolutionary [need-based] Senior mgr	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	4
13		**Purchase new (process) production line**	Opportunistic [technology/market-driven] Senior mgr	Negotiation [rational choice; balance of forces]	Authorisation [dominant form]	Implementation	3

Table 5.5: Decision/Action Matrix (contd.)

14	**Metalco C**	**Scale-up production & logistics operations**	Opportunistic [market/customer-driven] Evolutionary [growth/need-based] Senior mgr	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**4**
15		**Change plant layout**	Opportunistic [event-triggered] Senior/dept mgr	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**3**
16		**Develop/introduce new safety system**	Forced [Top Mgmt initiative] Opportunistic [event-triggered] Evolutionary [need-based]	Negotiation [rational choice]	Authorisation [dominant form]	Execution Implementation	**2**
17		**Extend plant/facility**	Evolutionary [growth/need-based] Dept mgr	Negotiation [rational choice; balance of forces]	Authorisation [dominant forms]	Implementation	**6**
18	**Technico**	**Introduce new product definition system**	Evolutionary [need-based] Senior mgr	Negotiation [balance of forces]	Affirmation [forced]	Implementation Actioning	**7**
19		**Introduce new ERP system**	Opportunistic [market-driven] Evolutionary [growth/need-based] Senior mgr	Negotiation [rational choice; balance of forces]	Authorisation [dominant form]	Implementation	**4**
20		**Facility upgrade/expansion**	Opportunistic [event-triggered] Evolutionary [growth/need-based] Senior mgmt	Negotiation [rational choice; balance of forces]	Authorisation [dominant form]	Implementation	**4**
21		**Enhance workforce culture**	Evolutionary [need-based; intrapreneurially based] Senior mgr	Consensus [collective agreement]	Affirmation [forced]	Implementation Actioning	**7**
22		**Invest in new technology/equipment**	Opportunistic [event-triggered] Evolutionary [need-based] Senior mgr	Negotiation [rational choice; balance of forces]	Authorisation [dominant form]	Implementation	**4**
23		**Relocate R&D function**	Evolutionary [need-based; intrapreneurially based] Senior mgr	Negotiation [rational choice; balance of forces]	Authorisation [dominant form]	Implementation	**6**
24		**Establish call centre**	Opportunistic [event-triggered] Evolutionary [need-based] Senior mgr	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**4**

Table 5.5: Decision/Action Matrix (contd.)

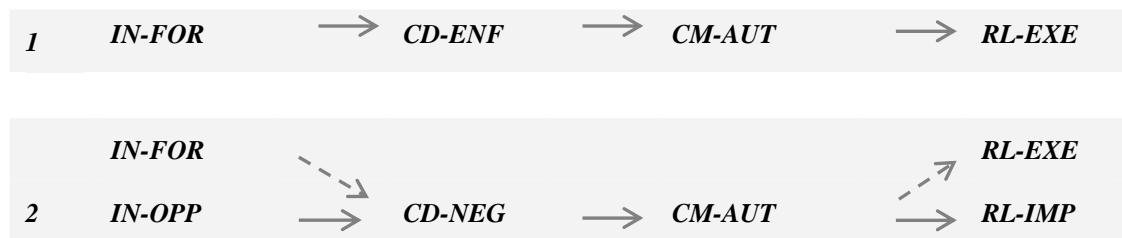|							
25		**Purchase new machinery/equipment**	Evolutionary [growth/need-based] Dept mgr	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**6**
26		**Facility upgrade; plant relocation**	Opportunistic [entrepreneurially driven] Evolutionary [growth/need-based]	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**4**
27		**Acquire another business**	Forced [top mgmt initiative] Opportunistic [entrepreneurially driven; event-triggered]	Negotiation [balance of forces; political manoeuvring]	Authorisation [dominant form]	Execution Implementation	**2**
28		**New contract for logistics/distribution**	Opportunistic [event-triggered] Evolutionary [growth/need-based]	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**4**
29	Ventico A	**Expand product line**	Evolutionary [intrapreneurially-based] Dept mgr	Consensus [collective agreement]	Affirmation [voluntary]	Actioning	**8**
30		**Change HR (recruitment) agency**	Evolutionary [need-based] Dept mgr	Consensus [collective agreement]	Affirmation [voluntary]	Implementation Actioning	**7**
31		**Create new staff position**	Evolutionary [growth/need-based] Supervisory staff	Negotiation [balance of forces; rational choice]	Authorisation [dominant form]	Implementation	**6**
32		**Change production management approach**	Evolutionary [need-based] Dept mgr	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**6**
33		**Change inventory (control) practice**	Evolutionary [need-based; intrapreneurially driven] Supervisory staff	Consensus [collective agreement]	Affirmation [forced]	Actioning	**8**
34		**Purchase new machinery/equipment**	Evolutionary [need-based] Dept mgr	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**5**
35	Tronicsco	**Invest in new process line (technology)**	Opportunistic [event-triggered; market/customer-driven]	Negotiation [balance of forces; political manoeuvring]	Authorisation [dominant form]	Implementation	**3**
36		**Introduce new ERP system**	Opportunistic [technology-triggered; market-driven]	Negotiation [balance of forces; political manoeuvring]	Authorisation [dominant form]	Implementation	**3**

Table 5.5: Decision/Action Matrix (contd.)

37	Machineco	**Quality accreditation**	Forced [top mgmt initiative] Opportunistic [event-triggered]	Enforced [position power]	Authorisation [formal authority]	Execution	**1**
38		**Strategic review of business operations**	Forced [top mgmt initiative] Opportunistic [entrepreneurially driven]	Negotiated [rational choice; balance of forces]	Authorisation [formal authority]	Execution Implementation	**2**
39		**Technology/capacity upgrade**	Evolutionary [growth/need-based] Senior mgmt	Negotiation [balance of forces; rational choice]	Authorisation [dominant form]	Implementation	**6**
40		**Facility upgrade/plant relocation**	Evolutionary [growth/need-based] Senior mgmt	Negotiation [rational choice; balance of forces]	Authorisation [dominant form]	Implementation	**6**
41		**Improve product design**	Evolutionary [intrapreneurially driven] Operational staff	Consensus building	Affirmation [voluntary]	Actioning	**8**
42		**Capacity addition/expand business operations**	Forced [top mgmt initiative] Opportunistic [entrepreneurially driven]	Negotiation [rational choice; balance of forces]	Authorisation [dominant form]	Execution Implementation	**2**
43	Ventico B	**Reconfigure product line**	Opportunistic [need-based]	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**3**
44		**Strategic review of business**	Forced [top mgmt initiative] Opportunistic [event-triggered]	Enforced [position power]	Authorisation [formal authority]	Execution	**1**
45		**Re-organise work system**	Opportunistic [need-based]	Negotiation [balance of forces]	Authorisation [dominant form]	Implementation	**3**
46		**Partnering with another business**	Forced [top mgmt initiative] Opportunistic [entrepreneurially driven]	Negotiation [balance of forces]	Authorisation [formal authority]	Execution	**1**
47		**Scale-down operations**	Forced [top mgmt initiative] Opportunistic [event-triggered]	Negotiation [balance of power; political manoeuvring]	Authorisation [formal authority]	Execution Implementation	**2**

Causal understanding of patterns is advanced using a three–fold approach: establishing the temporal order; examining associations; and eliminating alternative explanations. The temporal order of processes was established based on the participants' narratives of specific events, decisions and actions and time–specific data gathered through other sources such as documents. Associations were identified through comparison and matching of data gathered on the contextual variables against observed patterns/forms of MS formation. Elimination of alternatives was achieved by purposive sampling/ cross–case comparisons and using the findings of relevant previous research.

To this end, three conceptual schemas (clusters of patterns representing a more abstract theme) representing three alternative forms of strategy formation are further elaborated in this section.

Conceptual Schema 1 (Patterns 1 and 2):

| 1 | **IN-FOR** | → | **CD-ENF** | → | **CM-AUT** | → | **RL-EXE** |

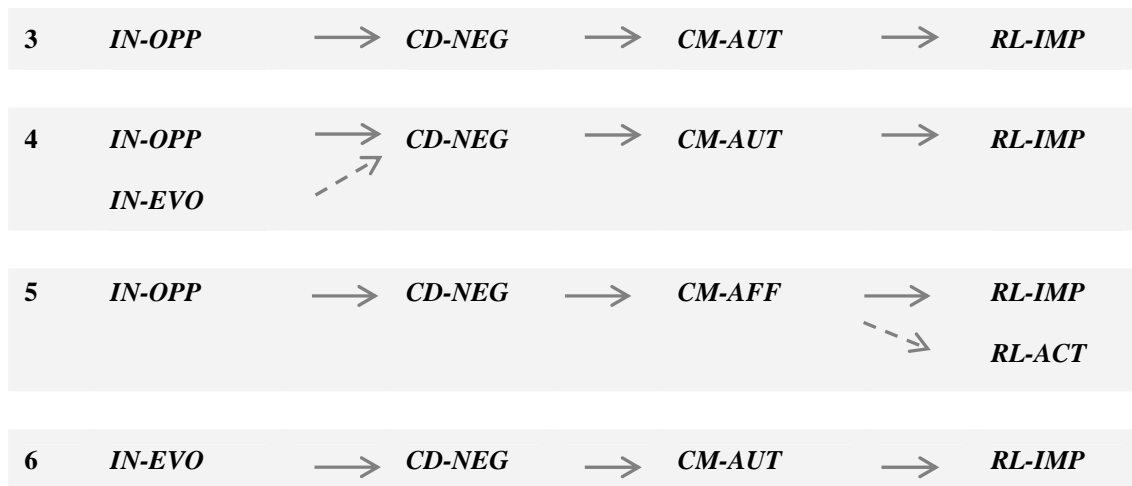| 2 | **IN-FOR** / **IN-OPP** | → | **CD-NEG** | → | **CM-AUT** | → | **RL-EXE** / **RL-IMP** |

The patterns of decisions and actions representative of the above conceptual schema shared a number of similarities among them and displayed a number of differences against the other two schemas discussed later. For instance, they were all initiated at the top management level, were significant in terms of their impact on business and assumed a relatively high degree of urgency. These initiatives were subject to neither rigorous evaluations nor extensive discussion and debate; nor did they meet with much resistance in the realisation stage compared to the initiatives in Schema 2. The type of initiatives in this schema included acquisition of, and partnering with, other businesses, ad–hoc (both reactive and proactive) but substantial measures aimed at countering competitor moves, major changes to operational policies and certain investments and improvement initiatives. A small number of initiatives that emerged in this mode or parts thereof were found to have followed the "negotiated" path of consolidation as indicated above.

Initiatives such as "review of the future of a business unit" and "acquisition of, or partnering with, another firm" were generally expected to be pursued by the top/senior management because of their strategic significance. However, there were other initiatives of operational nature, such as "change of production management approach" and "introduction of a new safety system", which also exhibited similar patterns of initiation, progression and realisation. Often, within the companies examined in this study, the latter type of initiative was triggered by key events such as a change of ownership, financial/cash–flow situation experienced by the business subject to review or acquisition, the escalation of operational problems (to a level that demanded urgent action), or a revelation of a major issue of adverse nature. Some initiatives in this mode were also influenced by the entrepreneurial motives or personal aspirations of the initiators and/or other actors involved. The remaining initiatives that belonged to this category usually emerged in response to competitor moves or regulatory requirements.

This form of MS formation was most prevalent in the two micro case companies and the two large case companies. Consolidation of initiatives was influenced by the position power of the top management within the large companies, compared to the charismatic and/or consensual leadership style of the top management in the case of micro companies. The consolidation process was relatively fast. For example, with some initiatives, there was no room at all to negotiate them, meaning that they were effectively directives that had to be carried out by the senior management with a high degree of priority. Other initiatives were negotiated within the requirements laid out by the initiators. There was also some evidence to suggest that initiatives were introduced in disguised forms to encourage the support of the lower–level staff and/or to minimise the impact of potential resistance to organisational change (which reflects the political dimension). In the case of publicly listed companies, it was also evident that the decisions and actions initiated by the top management were, in turn, influenced by the interest of the parent company and shareholders, which manifested itself in the form of top management's prior undertakings to deliver agreed results. In contrast, the micro company owner–managers' decisions and actions were largely driven by their personal aspirations and entrepreneurial instinct.

The realisation of the above initiatives were characterised by "execution", implying that there was limited room for the actors involved in exercising their discretion in carrying out the activities related to realisation. However, in order to achieve the outcomes set out in the directives, the actors involved may have been required to initiate a range of other smaller–scale initiatives and, depending on their significance, to seek formal approval from the higher management. Notwithstanding the swift and smooth actioning of the initial directives, those subsequent secondary initiatives were sometimes subjected to a number of forces that influenced and, on occasions, undermined the successful realisation of the original initiatives.

Conceptual Schema 2 (Patterns 3, 4, 5 and 6)

| 3 | *IN-OPP* | → | *CD-NEG* | → | *CM-AUT* | → | *RL-IMP* |

| 4 | *IN-OPP* | → | *CD-NEG* | → | *CM-AUT* | → | *RL-IMP* |
| | *IN-EVO* | ↗ | | | | | |

| 5 | *IN-OPP* | → | *CD-NEG* | → | *CM-AFF* | → | *RL-IMP* |
| | | | | | | ↘ | *RL-ACT* |

| 6 | *IN-EVO* | → | *CD-NEG* | → | *CM-AUT* | → | *RL-IMP* |

The initiatives representative of the above conceptual schema, which were identified as the mainstream form of MS formation, shared a number of characteristics with regard to the type/nature of initiatives, including their significance, financial commitment and the impact on the business, stimuli of initiation, actors involved, time frames/durations and the organisational settings in which they took place. Typically, these initiatives varied from major investments in facilities/process/technology/plant and equipment, through major improvement programs to changes in operational policies. Most of the initiatives within this cluster were originated at the senior management level. They were evoked by key events, more substantial preceding initiatives, technological advancements, major shifts in customer/market preferences and intrapreneurial endeavours. They were usually considered to be significant in terms of the financial commitments involved and/or their long–term and pervasive impact on the business, and they presented significant organisational challenges and business opportunities.

The actual mechanisms through which these initiatives were consolidated ranged from informal one–on–one discussions and dialogues between the initiator and the relevant higher–level manager, formal and informal discussions, reviews and debates in senior management team environments, independent peer reviews and evaluation of formal project/capital proposals. Major initiatives within this cluster were subject to some assessment or evaluation supported by quantitative data and/or based on intuitive judgement, of their economic merits, feasibility and business value.

A significant number of initiatives that emerged in the "evolutionary" mode were also found to have followed the "negotiation" path of consolidation as depicted in the above patterns. These initiatives typically represented relatively large–scale capacity additions, facilities expansion and other major growth–based needs. Furthermore, most of them had evolved from relatively less significant to more substantive issues, over time, before they were formally launched as strategic initiatives.

Although the evaluations of initiatives within this stream reflected a high degree of procedural rationality, there was no evidence to conclude that they were comprehensively or substantially rational to the extent stipulated in the economic models. Capital/project proposals were the most formal instruments used in evaluations. In general, the quantitative data was used to support what were called "informed judgments". In the case of group/team situations, the discussion or review process resulted in the emergence of a majority view supporting (or otherwise) an initiative. Depending on the degree of procedural rationality reflected, the consolidation process was classed as rational choice or dominant form. In a small number of cases, some level of political manoeuvring was also evident in driving the direction/outcome of the consolidation process.

The commitment of initiatives took the form of approving (or rejecting) the rational choice and/or formally endorsing the dominant view, with any adjustments or addition of conditions at the appropriate level of higher management. This authorisation (approval/endorsement) also meant allocating or committing resources towards the realisation of those initiatives. The vast majority of initiatives that followed the negotiation mode of consolidation were agreed at the top/senior management level

before they were formally authorised by the Board of Directors/Managing Director, except for a very few cases in which they were authorised or affirmed at the senior management level. As such, the initiatives that emerged in the "opportunistic" mode and/or consolidated in the "negotiation" mode were the ones that underwent the most rigorous scrutiny, comprehensive evaluations and the most rational form of realisation.

Realisation of these initiatives often took the form of implementation reflecting a higher degree of planning, organising, controlling and reporting than in the other two schemas. The actual mechanisms of realisation varied depending on the nature and the scale of initiatives with the most comprehensive form extending to formal project management. These initiatives were also observed to be the ones that faced the most resistance from the shop–floor staff in the implementation phase. The time taken to realise these initiatives was generally longer than that for the previously discussed schema and the one that follows. These longer durations are partly explained by the size of the initiative, the resource commitments involved and the relatively rigorous evaluation process they went through, as well as the high level of resistance as acknowledged above. The patterns representative of this schema were found across all nine cases with the exception that they were less prevalent in smaller companies.

Conceptual Schema 3 (Patterns 7 and 8):

7	*IN-EVO*	$\longrightarrow$	*CD-CON*	$\longrightarrow$	*CM-AFF*	⤴ *RL-IMP* $\longrightarrow$ *RL-ACT*
8	*IN-EVO*	$\longrightarrow$	*CD-CON*	$\longrightarrow$	*CM-AFF*	$\longrightarrow$ *RL-ACT*

The majority of initiatives within the above conceptual schema were conceived as small–scale investments that supported growth/capacity additions, operational problem–solving initiatives and/or incremental improvement initiatives, mainly at the individual department managers' or supervisory level. They also emerged along with other initiatives of smaller scale that were derived from the more substantial initiatives discussed in the previous schema. For example, in order to reduce extra scrap and longer change–over time that had resulted from a prior decision to change the production management approach (imposed by top management) a manufacturing

manager had to initiate a range of actions and decisions. These initiatives took different paths and forms of consolidation, commitment and realisation of their own.

Consolidation of initiatives reflected in the above patterns was predominantly through consensus building via informal discussions, with some degree of cold–canvassing among initiators, their managers and other stakeholders. The commitment was mainly in the form of affirmation with the agreement of the higher–level manager and resource commitments made within the allocated budgetary provisions at the department level. Commitment to some initiatives such as incremental capacity additions was often forced by the circumstances, whereas others involving small–scale problem–solving and process improvements were based on the voluntary commitment of initiators.

Realisation of initiatives within this schema was often through the individual actions taken by the initiators, with inputs from other supervisory staff with the exception that some initiatives or parts thereof were required to be formally implemented in order to adhere to the company policies/procedures which, in turn, were dependent on such contextual factors as the organisational structure and the level of firm development.

Strategy formation in this form was observed within small–to–medium–sized firms and was favoured in organisational settings characterised by intrapreneurial managers, an empowered workforce and a cohesive organisational culture.

Overall, each of the three conceptual schemas was representative of certain decisions and actions and particular types of organisations, and they were influenced by specific individual, organisational and external contextual factors, leading to certain outcomes. These distinctions are explicitly recognised in the following theoretical propositions.

The mode of strategy initiation is dependent upon the nature of the initiative, the source (actor–specific) and stimuli of initiation and the influence of certain contextual factors. The contextual factors that had the most significant influence on strategy initiation were the external factors, such as industry rivalry and market stability, and the internal factors, such as the size and maturity of the firm.

- initiatives that emerged in the forced mode are strategically significant and they display a sense of urgency. They are most likely to emerge in response to major competitor initiatives, regulatory requirements or directives from the top management. This mode of initiation is favoured in highly competitive environments in large firms and in innovative small organisations.

- initiatives that emerged in the opportunistic mode are significant investments in terms of both their strategic impact and financial commitments. They are most likely to be triggered by breakthroughs in technology and/or major market opportunities, initiated as planned moves, or to result from prior (internal) events and initiated at the senior management level. This mode of initiation is favoured in relatively stable competitive environments and in medium–to–large–sized organisations.

- initiatives that emerged in the evolutionary mode are relatively less significant in terms of both financial commitment and their impact on business. They are most likely to emerge as logical and incremental responses to growth–based needs, recurrent problems and through experimentation. In larger firms, these initiatives are originated at the junior management level. This mode of initiation is favoured in relatively stable competitive environments, slow–growth markets and in small–to–medium–sized organisations.

The path of consolidation is dependent on the mode of initiation and the types and the extent of the influence of contextual factors. The contextual factors that can have the most significant impact on the paths of consolidation are the internal organisational factors, such as organisational structure, culture and individual and political factors.

- faster or prolonged and unitary or multiple consolidations were observed for initiatives in the forced mode, depending on the hierarchical vs. team–based organisational structures and the cohesive vs. hostile cultures.

- consolidations with higher degrees of procedural rationality were observed for initiatives in the opportunistic mode within hierarchical structures and adversarial/hostile cultures.

– iterative multiple paths of consolidation were observed for initiatives in the evolutionary mode in team–based structures and cohesive cultures.

Commitment to initiatives was observed in two major forms: authorisation and affirmation. The form of commitment was dependent upon the mode of initiation, and the path of consolidation. The type of organisational structure and the stage of firm development determine, to some extent, the degree of formality in this process.

– initiatives that emerged in the forced mode and consolidated through the enforced path were authorised by the top management.

– initiatives that emerged in the opportunistic mode and/or consolidated via the negotiated path were authorised by the top/senior management with the agreement of the senior management.

– initiatives that emerged in the evolutionary mode and consolidated through consensus building were affirmed by the senior/higher management.

Realisation of strategic initiatives was dependent on the source of initiation and the form of commitment. The stage of firm development determined, to some extent, the formality of this process.

– initiatives that emerged in the forced mode and authorised by way of exercising formal authority of the top management were executed and/or implemented by the senior management within the strict guidelines laid down by the initiators.

– initiatives that emerged in the opportunistic mode and authorised through the confirmation of the dominant view or rational choice were formally implemented or project–managed by the senior and/or middle management with the involvement of other staff and external parties.

– initiatives that emerged in the evolutionary mode and affirmed at the lower levels of management within their budgetary provisions were actioned by the initiators and the supervisory staff.

5.5. Chapter Summary

This chapter constructed the across–case patterns of MS formation in addressing the two research questions. The disaggregation–re–organisation–aggregation approach used in analysing text–based data facilitated the progressive building of across–case patterns, themes and conceptual schemas, as well as the final conceptual model.

Competitive priorities are arrived at based on the company's overall strategic direction, profit goals and product–market strategies, while taking market needs and competitor movements into account. They are often shaped by the top management's intuitive judgement and their entrepreneurial instinct, as well as their personal aspirations. The process of translating competitive priorities into strategic decisions and actions involves managerial interpretation, assessment/evaluation and intuitive judgement. However, strategic decisions and actions are not always derived from competitive priorities, as a number of other stimuli associated with the strategic initiatives in the form of catalysts, triggers, forces, problems and needs are sometimes not linked to the existing portfolio of competitive priorities.

Deeper structures in MS formation processes represent linear and parallel, convergent and divergent, sequential and iterative progression of strategic initiatives across four broad phases identified as initiation, consolidation, commitment and realisation. These multiple progressions are explained by the nature of strategic initiatives, the causal relationships between the phases and/or modes and the influence of internal and external organisational contextual factors. The more abstract (aggregate) patterns representative of these progressions are depicted in the conceptual model.

The alternative forms of MS formation are embodied in the core patterns of initiation, progression and realisation outlined above. The three forms of MS formation presented in terms of conceptual schemas represent certain decisions and actions and particular types of organisations, and they were influenced by specific individual, organisational and external contextual factors leading to certain outcomes. These distinctions were explicitly expressed in terms of several theoretical propositions.

CHAPTER 6: DISCUSSION

6.1. Introduction

This chapter discusses the research findings in the context of extant literature in order to make meaning of those findings. It also re–visits the broader aspects of the manufacturing strategy (MS) concept, in the light of the findings of this study. This is followed by an evaluation of the methodological approach used.

In a recent review of literature, Hutzschenreuter and Kleindienst (2006) identified "three broad categories of factors" representative of strategy process research, namely antecedents, processes and outcomes (p. 676). Most of these factors have also been used in literature as major constructs in conceptualising strategy processes. In addition, a significant body of literature has focused on the individual decisions and cognitive behaviour of decision makers. This study was informed by several micro–level studies of strategy processes, but it was largely influenced by the studies of business strategy which have had an emphasis on organisational decision processes. Buffa (1980) called for the expansion of "aggregation–disaggregation research" in Operations Management (OM) in order to "build models that capture the essence of a problem and provide insights to the managers in aggregate terms" (p. 3). Pettigrew and Colleagues (1992, 2001) have advocated studying strategy processes across a number of levels of analysis and simultaneously aggregated and disaggregated analysis. Huff and Reger (1987) have observed that "the most significant contribution to research progress in the [strategy] field will, in fact, be made by those who cross the boundaries that have been carefully built up over the last several decades" (p. 227). This study has effectively heeded these calls.

It is widely agreed that the share of MS process research in the total body of MS research is disproportionately low. Of the limited research on MS processes, the majority has used quantitative approaches and has dealt with the MS process at highly abstract levels. There are only a few published studies that have investigated MS process aspects in sufficient detail, using qualitative approaches, to be able to develop deeper insights into the

dynamics of MS formation. As such, the findings of this study are compared, contrasted and contextualised against the findings of several other studies that have been identified as seminal and/or the most recent/relevant in the areas of MS and business strategy process research. In order to facilitate this process, the pertinent aspects of the selected MS literature are reviewed in more detail in the following section. In effect, it constitutes an extension to Chapter 2 (literature review), and fulfils a key requirement in reporting the findings of qualitative studies from an interpretative perspective.

6.2. Manufacturing Strategy Process Research: Empirically Derived Models

Compared to the significant body of conceptual work that has dealt with the various aspects of, and issues relating to, the MS process (as cited in Chapter 2), a much smaller number of empirical studies have examined MS processes in practice, using qualitative methodologies. These include studies by Barnes (2002), Cheng and Musaphir (1996), Marucheck *et al*. (1990), Rytter *et al*. (2007) and Swamidass *et al*. (2001). In addition, Kim and Arnold (1996) and Dangayach and Deshmukh (2001b) have developed MS process models based on empirical studies conducted using questionnaire surveys and interviews. Marucheck and colleagues (1990) have used the following research question:

> In practice, how is manufacturing strategy formulated and implemented within a corporate strategy framework? (p. 103)

This research question implies that MS is first formulated and then implemented within the broader framework of corporate strategy. Although it has been reported as an exploratory study, such a restricted view would allow little room for other, perhaps more subtle, forms of MS formation to emerge through the empirical investigation. The findings, as well as the research design also suggest that the MS process has been captured/studied at a highly abstract level with an a priori assumption of the rational planning approach. A subsequent study by Cheng and Musaphir (1996), which has also been reported as an exploratory study, shows a similar a priori bias towards the rational planning approach. Its objective has been "to gain an in–depth understanding of the process of formulating and

implementing manufacturing strategy in practice" (p. 1246). Thus, its objectives, as well as the research design, which has involved structured interviews, indicate the presumption of a normative approach. Both studies have presented the findings in virtually identical forms of neatly laid–out top–down models, thus confirming the existence, in practice, of the rational planning approach to MS development advocated in literature. The graphical displays of MS processes developed in these studies reflect hierarchical sequences of constructs such as strategy, business plan, objectives, key success factors, manufacturing issues and assigned responsibilities, as well as performance measures. The most detailed graphical display that has been included in both studies is reproduced below (Figure 6.1):
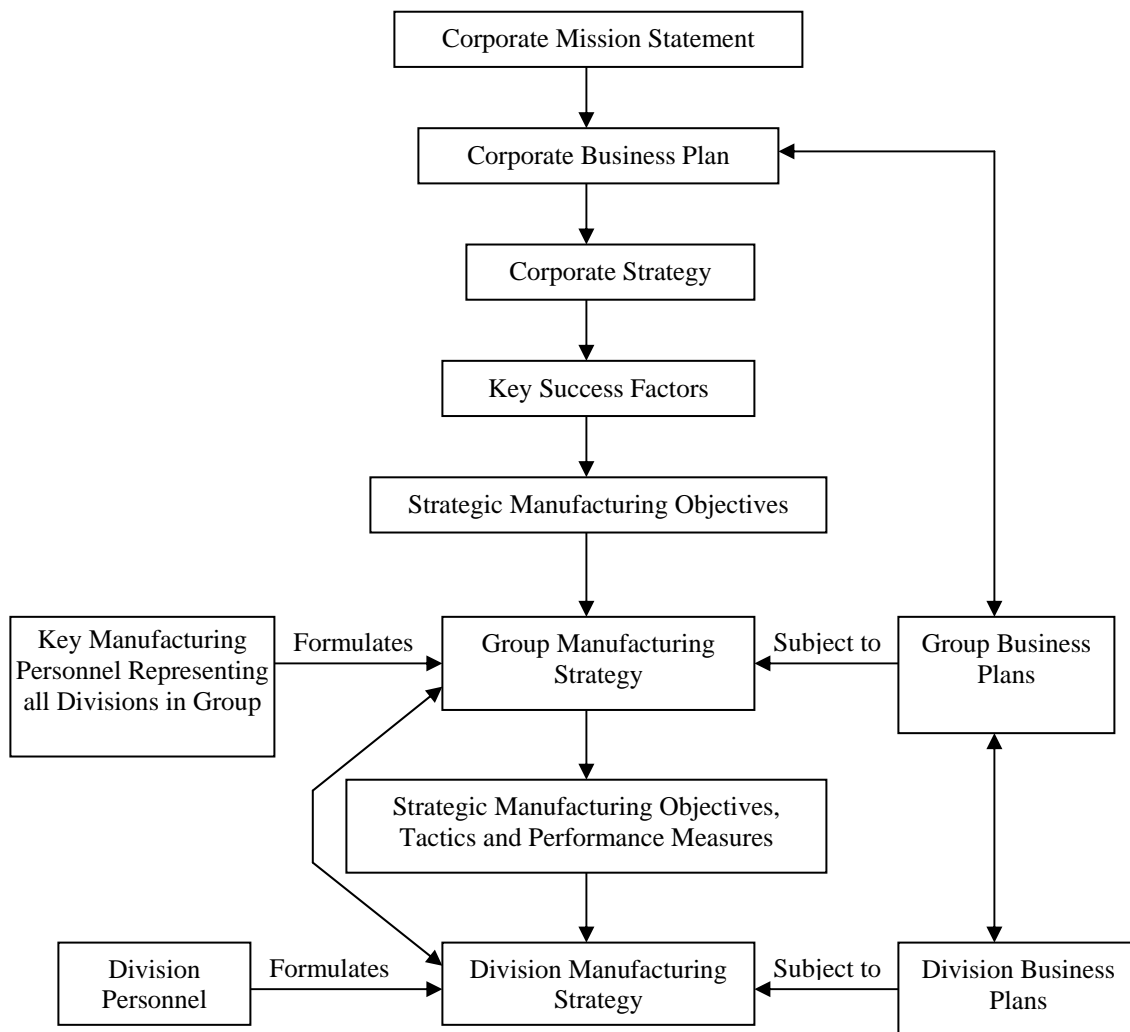
Figure 6.1: Hierarchical Approach to MS Formulation
(Sources: Marucheck *et al*., 1990: p. 106; Cheng and Musaphir, 1996: p. 1246)

Dangayach and Deshmukh (2001b) found a prevalence of similar top–down approaches in the companies studied and presented their findings using a similar hierarchical process, a sample format of which is reproduced below (Figure 6.2).
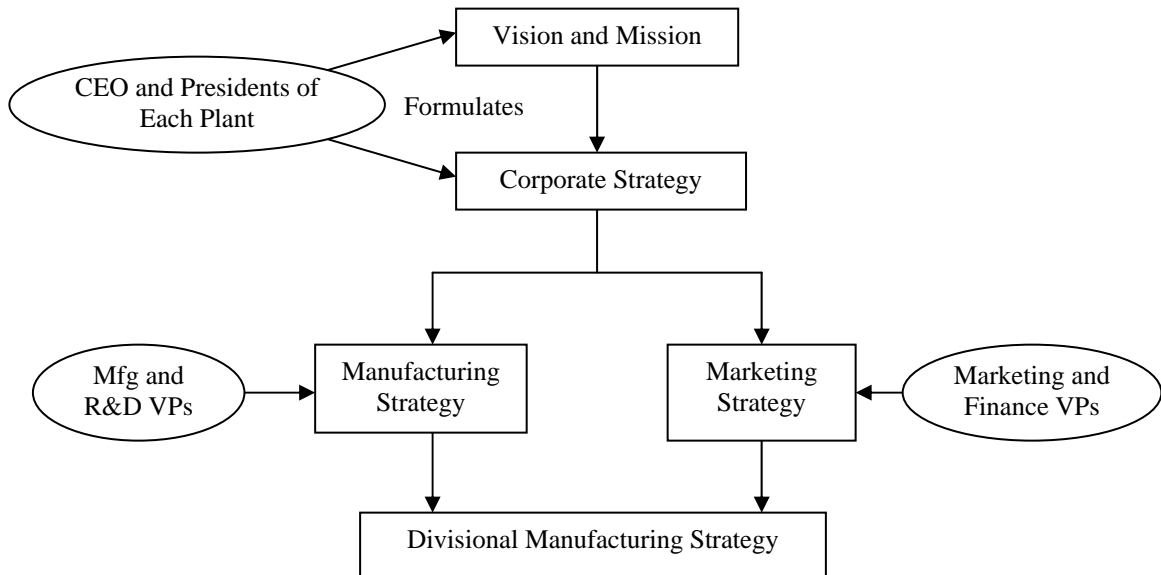
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Figure 6.2: Hierarchical Approach to MS Formulation
(Source: Dangayach and Deshmukh, 2001: p. 2376)

All three studies above have used similar samples, with a bias towards high–performing firms. The findings have recognised the significance of MS implementation as opposed to MS formulation, while highlighting the challenges managers face in communicating and implementing strategy. They have overwhelmingly confirmed the existence of a clearly articulated top–down planning approach to strategy development in practice, from the corporate level through divisional/group level (where applicable) to the functional (manufacturing) level. The influence of some organisational contextual factors such as the firm size and personal attributes of decision–makers has also been observed to be consistent with the findings of previous strategy process research. In addition, the results of these studies have revealed a number of pre–disposing conditions, such as major changes in business situation and the presence of an influential individual (strategy champion), which have triggered the formulation and implementation of a formal MS.

However, another more recent empirical study by Swamidass and colleagues (2001) has found that, with or without the formal planning process, organisations successfully engaged one or more of the following alternatives or de–facto manufacturing strategies:

- a coherent and incremental pattern of actions;
- manufacturing process improvement programs; and
- core manufacturing capability development programs.

These alternative forms of MS formation have been captured using a process–mapping approach based on semi–structured interviews conducted with senior managers of four case companies. The process–mapping approach, through a series of questions covering what, how and why aspects of MS development, has established the patterns in strategic decision–making and action–taking, along with key actors involved in the process and the causal links between key events, actions and decisions. The authors have further argued that the four different forms of MS development correspond to the strategic role of manufacturing depicted in the four–stage model of Hayes and Wheelwright (1984). However, specific links between alternative forms of MS development and organisational contextual factors have not been reported in this study.

By comparison, Barnes (2000) has used the two broad research questions cited below, aimed at exploring both the deliberate and the emergent perspectives of MS formation.

How does a company's manufacturing strategy form in practice?
Why does the manufacturing strategy form in this way? (p. 12)

The multiple case study approach employed in that study has facilitated an in–depth investigation of MS formation in practice through examination of the causes of, and influences on, strategic decisions and actions, thereby allowing rich insights into the dynamics of MS formation in the three major case organisations studied.

The findings are illuminating in that they have been presented in the form of a descriptive process model (Figure 6.3) highlighting the interpretative process used by managers under

the influence of individual managerial, cultural, political and ownership factors in arriving at strategic manufacturing decisions and actions. The findings have confirmed, with empirical evidence, that "MS formation in practice is a complex process involving a combination of emergent and deliberate actions and decisions" (p. 218).
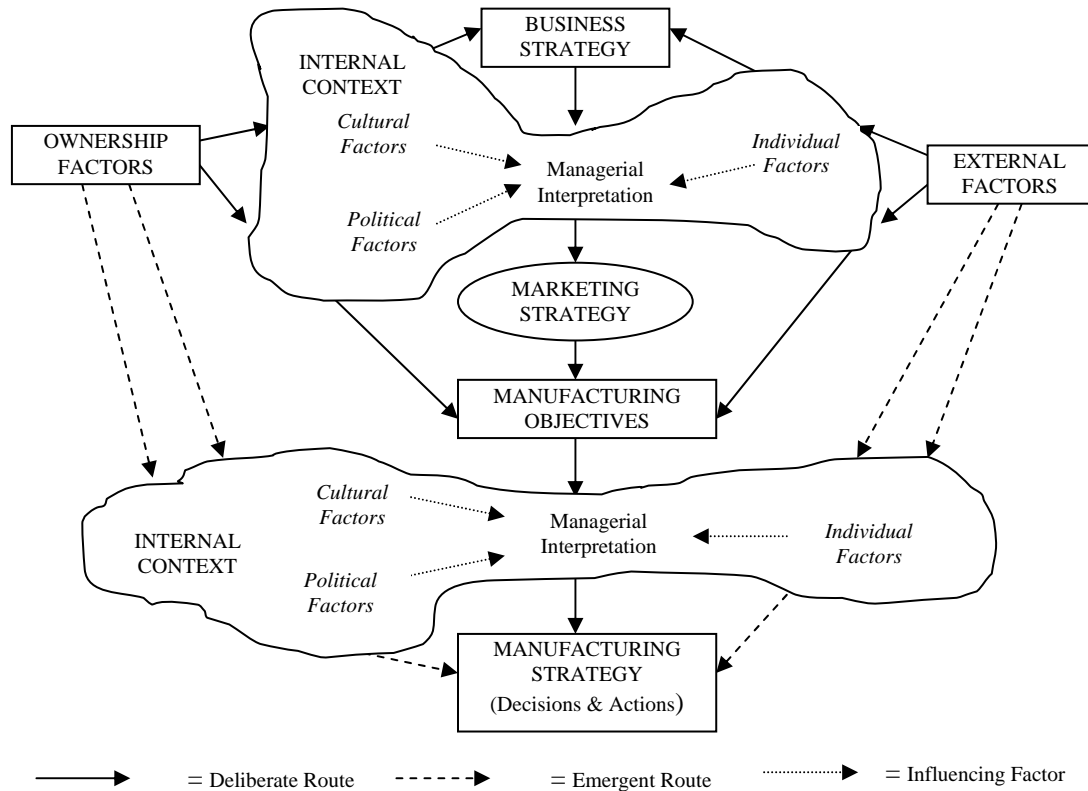

Figure 6.3: The Manufacturing Strategy Process (Source: Barnes, 2002: p. 1104)

In contrast, the most recent published empirical study referred to in this thesis, Rytter *et al.* (2007), has conceptualised the operations strategy (OS) formation process as "events of dialogue and action taking place in five dimensions of change: technical–rational, cultural, political, project management and facilitation" (p. 1107), as schematically shown in Figure 6.4 . Using a combined action research and longitudinal single case study approach, it has developed valuable insights into the dynamics of OS formation in practice. The findings have further confirmed the complexities of OS process that displayed "sequential and parallel, planned and emergent, ordered and disordered and top–down and bottom–up characteristics" (p. 1109) and the influence/interaction of contextual factors.
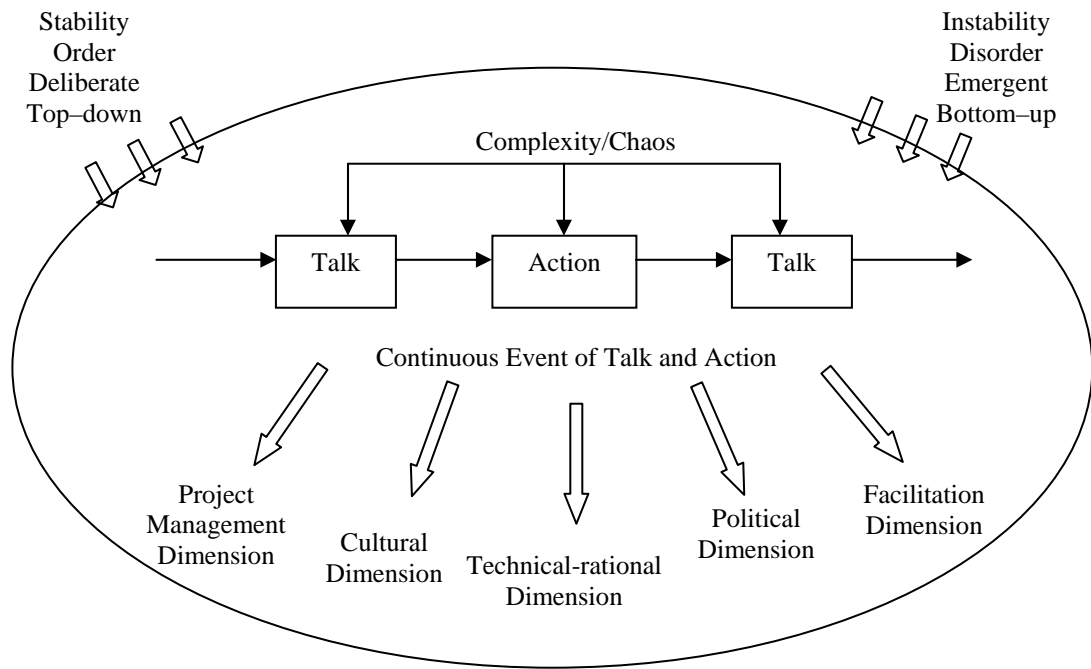
Figure 6.4: Conceptualisation of the Operations Strategy Process
(Source: Rytter *et al*., 2007)

Apart from the long–held view of top–down planning, two major alternative views on MS formation have emerged through the two most recent empirical studies cited above.

The top–down planning model has been supported by several empirical studies (Chen and Musaphir, 1996; Dangayach and Deshmukh, 2001b; Marucheck *et al*., 1990) and various aspects of that model have been empirically tested, mainly using statistical techniques, by a number of researchers (Kim and Arnold, 1996; Neely *et al*., 1994; Platts and Gregory, 1992; Tan and Platts, 2004). The two recent alternative views/models have not been substantiated by further empirical studies. However, they are highly consistent with the findings of business strategy process research discussed in Chapter 2. The findings of Swamidass and colleagues (2001) have been confirmed by the later studies, with empirical evidence, but they have provided no further details of the dynamics of those alternative forms of MS formation.

6.3. Enfolding the Findings in Extant Literature

The key findings of this research study can be summarised as follows:

- Deeper structures of MS formation have been constructed in the form of patterns in decision–making and action–taking, grounded in empirical data;

- These patterns have been aggregated into a conceptual model consisting of the four phases of initiation, consolidation, commitment and realisation;

- The alternative forms of MS formation have been explicated in the form of three conceptual schemas consisting of multiple modes of initiation, alternative paths of consolidation and differing forms of commitment and realisation; and

- Specific organisational contextual factors have been related to these alternative forms of MS formation in an effort to advance causal understanding.

In addition, this study has demonstrated the value of using qualitative approaches in exploring an under–researched socio–technical phenomenon within the OM field.

Conceptualising strategy processes in the form of phases, stages, steps and routines is not a new development at all (Witte, 1972). Many empirical studies have captured strategic decision processes in this form at varying levels of analytical abstraction, as was revealed in Chapter 2. Prominent examples include the early modifications to the popular "Rational Choice" model (Cyert *et al*., 1956; Dufty *et al*., 1962), the "Intelligence–Design–Choice" model (Simon, 1965), the "Identification–Selection–Development" model (Mintzberg *et al*. 1976), the "energy management decision–making system" consisting of three specific phases (Fahey, 1981), the "Gestation–Resolution" phases (Narayanan and Fahey, 1982) and the "Quasi Strategic–Defining Episode–Strategic" phases (McCarthy and Leavy, 2000). While most of the early studies have had a relatively narrow focus on cognitive behavioural aspects of decision–making, the later studies have taken a more encompassing organisational process perspective in exploring strategy processes.

By comparison, MS processes have neither been captured in the form reported in this thesis nor at this level of detail previously. For instance, most models referred to in the previous section have emphasised the links between business–level strategy, functional strategy and business performance (Kim and Arnold, 1996). Except for the three most recent studies, they have hardly reflected the possibility of alternative forms of MS formation, or the dynamics and complexities of MS processes. In contrast, the three conceptual schemas explicated in this study represent deeper structures of MS formation in a naturalistic context. The underlying patterns are quite useful in explaining the alternative forms of MS formation, as well as in relating the specific contextual factors to those alternative forms. Moreover, the four phases of MS formation constructed in this study are significantly different from the phases represented in other currently available models of organisational decision–making processes with regard to their process characteristics and the level of analytical abstraction.

Key measures that have been used in strategy literature to differentiate between alternative conceptualisations are their reliability and utility. The reliability is evaluated based on the rigour of methodological approach used and the assumptions on which those alternative models are based. The utility is often compared with regard to their descriptive, explanatory and predictive capacity. However, the value of cumulative knowledge and understanding advanced through these alternative approaches is often overshadowed by the mainly epistemological and rhetorical rivalry that exists among them.

This study has taken a measured approach in addressing the major criticisms and recurrent issues raised in MS literature, including those relating to the use of methodological approaches. By way of drawing from relevant studies of strategic decision–making and strategy process research, using a novel and more rigorous methodological approach than those used in previous MS process studies and following an elaborate reporting format, it demonstrated the best possible research effort within the constraints imposed by the circumstances. The contributions, discussed in some detail in the remainder of this section and summarised in the following chapter, demonstrate that commitment and effort.

6.3.1. Ways in Which Competitive Priorities are Arrived at and Translated into Strategic Manufacturing Decisions and Actions

Consistent with the definition of MS adopted in this study, the concept of competitive priorities was treated as a core part of MS, irrespective of the priorities' alternative (explicit or implicit) manifestations. Despite not recognising the term "competitive priorities" by itself, all nine firms used the common terminology found in literature when referring to the basis of competition. In the case of larger firms, competitive priorities were explicitly or implicitly derived from business strategy. With the remaining firms, in the absence of an explicit business–level strategy, they were driven by the overall strategic directions agreed upon at the senior management level. As observed with the majority of strategic initiatives within the "opportunistic" mode, these findings are broadly consistent with those of the previous empirical studies of MS referred to in the preceding section.

In addition, there are other useful findings that contribute to further advancing the current understanding of the ways in which competitive priorities are arrived at. This study found that competitive priorities are shaped by several other forces and, in some cases, even new competitive priorities could emerge without having been formally recognised them in advance. Apart from a formally recognised business strategy or agreed–upon strategic directions, there were a number of other factors that could alter the mix of competitive priorities and/or their relative importance. They include short–term profit goals, changing product–market strategies, ad–hoc reactions to competitor moves, evolving profile of capabilities and entrepreneurial instinct. Moreover, consistent patterns in strategic initiatives that emerged in the "forced" and "evolutionary" modes can lead to the emergence of substantially new dimensions of competitive priorities.

For example, one large company's documented strategic plan did not identify "price" as a competitive priority. However, detailed descriptions of strategic initiatives undertaken over a period of three years suggested that the majority of them consistently aimed at reducing costs. The management preferred not to compete on price but was compelled to do so because of the pressure from competition and other external factors, such as the

rising exchange value of the Australian dollar. For certain products, price was clearly seen as a key factor in winning orders. In contrast, another small firm formally recognised "price" as part of its competitive criteria, after years of resistance, due to escalating pressure from low–cost manufacturing in emerging countries. While revealing these detailed process dynamics, the above observations provided further empirical evidence to support the claims of the dynamic nature and emergent aspects of MS formation.

Barnes (2002) found empirical evidence to support a rational process in the identification of manufacturing objectives, which he considered "… were arguably derived logically from the company's business strategy via the articulation of a marketing strategy" (p. 1101). However, it should also be noted that he had qualified this statement using Hayes and Wheelwright's (1984) four–stage model. By comparison, this study did not find sufficient evidence to support such a high degree of rationality or an explicit intermediary role for marketing (strategy) in the way competitive priorities are arrived at. Instead, it was found that marketing took a strong proactive stance in shaping competitive priorities and major strategic initiatives through its influential role in setting up product–market strategies and profit goals for the company, as depicted in Figure 5.1, in Chapter 5. In addition, this study also observed the strong influence of the top management (CEO/GM/MD) in shaping competitive priorities, often driven by their personal aspirations and/or entrepreneurial insights. In contrast, manufacturing made little contribution towards setting up these critical organisational goals, but perceived that its task was to deliver on those goals. As such, manufacturing's role in this process was found to be largely reactive and far less influential than that of marketing. This evidence is consistent with the findings of the two previous empirical studies by Hum and Leow (1992) and Hyland *et al.* (2001). However, it suggests that the proactive role expected to be played by manufacturing in arriving at competitive priorities was not evident in almost all the companies studied.

These observations highlight the importance of arguments advanced by Terry Hill (1989, 1992, 2005) in favour of a more robust discussion and debate between manufacturing and marketing in agreeing on a set of competitive priorities and the need to continually re–

assess the match between the profile of a firm's operations systems and its product–market profile, in the light of the changes in the market and business environment.

Compared to the ways in which competitive priorities were arrived at, the ways in which they were translated to strategic manufacturing decisions and actions were much more difficult to delineate. Even in the most clearly articulated strategic plan, the causal links between competitive priorities and strategic initiatives were not laid out in discernible forms. For example, the most detailed account read as "key inputs drive the strategy development to a strategic statement leading to specific strategic initiatives". Although the documents did not reveal any rules or conventions guiding this part of the process, the participants used a range of conceptually rich descriptors such as assessing the impact of drivers for change, appraisal of business value, testing of assumptions, intuitive judgement, judgement albeit informal and gut feelings. These descriptors, along with other more comprehensive descriptions of strategic initiatives, were used in exploring the relationship between the competitive priorities and the strategic initiatives.

Despite the apparent lack of clarity in the process, the majority of strategic decisions and actions initiated in the "opportunistic" mode were found to be highly consistent with the stated or agreed–upon competitive priorities. However, a number of other initiatives that emerged in the "evolutionary" mode were found to be not as consistent. For example, certain operational problems, improvement needs, competitor moves and individual performance objectives triggered decisions and actions that did not necessarily reconcile with the recognised competitive priorities. There were no particular mechanisms in place to ensure the consistency of such decisions/actions and the competitive priorities. In cases where competitive priorities were only implicitly recognised through mutual agreement at the senior management level, strategic initiatives were guided by the actor's own interpretation of those implicit priorities and intuitive judgements. Such initiatives were either actioned by the initiators themselves, or were consolidated into more substantive initiatives. Likewise, the majority of initiatives in the "forced" mode were also found to have not formally assessed for their consistency with recognised competitive priorities. In larger firms, major improvement programs and other key initiatives introduced, as directed

by headquarters, were not found to be always consistent with the competitive priorities at the SBU level. They were often rolled out as company–wide programs or were enforced by headquarters. Therefore, there was no room for those initiatives to be substantially modified at the discretion of the SBU–level management to match local conditions and/or accommodate SBU/plant–level requirements.

Barnes (2002) made similar observations regarding the ways in which manufacturing objectives were translated into manufacturing decisions and actions. For example, he noted that in one of the case companies studied "… an existing and very strong manufacturing paradigm was now being challenged by the changes in the business strategy of the company. This seemed to be leading to mismatches between its manufacturing and business strategies …" (p. 1102). He further asserted that "while some manufacturing actions and decisions do occur as a result of the deliberate predetermined intentions of the company's senior business managers, emergent incremental actions and decisions always play a part" (1103).

Despite marked differences in the research design and the overall context of the two research studies, the findings of Rytter and colleagues (2007) are broadly consistent with the above observations. Although the "three broad phases" (p. 1107) of MS reflect a substantially higher level of abstraction than those reflected in Barnes (2002) and this research study, the underlying patterns of "dialogue and action" seem to resemble the "managerial interpretative process" referred to in Barnes (2002) and the "deeper structures" of strategy formation referred to in this study. If the less well–articulated "three broad phases" were taken to mean "Pre–intervention – Intervention – Post–intervention", they could be matched with the level of abstraction reflected in the "Quasi Strategic – Defining Episode – Strategic" phases reported in McCarthy and Leavy (2000).

What can be inferred from these observations is that, in practice, strategic decisions and actions emerge through dynamic, interactive and iterative interpretative processes (rational, as well as intuitive), involving technical, as well as a variety of other organisational and environmental considerations.

Opportunities for further exploring and explaining any causal relationships among these elements were constrained by the highly intuitive nature of this part of the process. It was also partly affected by the disposition of the individuals involved and the research design used. On the one hand, contrary to what has been prescribed in normative literature, none of the case companies had clearly articulated or detailed frameworks for guiding strategic manufacturing decisions and actions. On the other hand, to extract deeper meaning of the above descriptors used by participants, more intrusive methods such as action research may be needed. Kim and Arnold (1996) referred to this issue as a gap between MS theory and practice and sought to remedy it through developing a more disaggregated (less abstract) process. Their proposed process model comprised three constructs, between business strategy and business performance, representing distinct stages of interpretations namely competitive priorities, manufacturing objectives and action plans.

The patterns (detailed in Chapter 5) in strategic decision–making and action–taking help explain the de–facto forms of MS development presented in Swamidass *et al*. (2001) and they corroborate the patterns of "talk–action–talk" reported in Rytter *et al*. (2007). However, there remained a greater challenge in exploring and explaining the dynamics of these alternative forms of MS formation at appropriate levels of analytical abstraction. Building on the impetus provided by Barnes (2002), this study took a step in that direction.

6.3.2. Patterns of Manufacturing Strategy Formation and Explanatory Accounts

The alternative forms of MS formation constructed in the form of three conceptual schemas are underpinned by linear and parallel, converging and diverging, sequential and iterative progression of initiatives across four major phases. These conceptual schemas depict the intertwined and embedded nature of the so–called deliberate and emergent forms, as well as the more rational and less rational elements of MS formation. These findings corroborate the key findings of Barnes (2002) and Rytter and colleagues (2007), which asserted the dynamic and complex nature of MS/OS formation, and the alternative forms of MS development cited in Swamidass *et al.* (2001). The explanations as to why

these patterns exist that way are provided by the deeper structures of MS formation (organisational decision processes) underpinning these conceptual schemas.

The multiple modes of initiation, alternative paths of consolidation and differing forms of commitment and realisation of strategic decisions and actions are explained by: the nature of strategic initiatives; the causal relationships between the modes/phases themselves; and the influence of internal and external organisational contextual factors. For instance, the alternative paths of consolidation were dependent on the significance, complexity and urgency of the initiatives, the source and/or stimuli of initiation and, in some cases, the personal attributes of the initiators. The form of commitment, in turn, was dependent on the mode of consolidation and the type of actors involved. In addition, a range of organisational contextual factors influenced the mode of initiation, the form of realisation and other aspects such as the temporal dimension. However, pursuant to the scope and objectives of this study, no attempt was made to graphically represent their influence in the conceptual model. Neither the research instruments nor the rudimentary modelling formalisms used in this study facilitated establishing the links between contextual factors and process parameters in concrete terms. Instead, the text–based descriptions, explanatory accounts and data displays provided in Chapter 5 are supplemented by this discussion, which interprets the influence of contextual factors with reference to the findings of similar research undertaken previously.

Exploring the influence of organisational contextual factors was a primary measure used in this study in explaining the differences between the alternative forms of MS formation in practice. It began with the understanding that a number of internal and external contextual factors can influence MS formation processes. Strategy process literature has reported on the direct and moderating effects of contextual factors on strategy formation based on empirical studies (Ketchen, *et al*., 1996: Papadakis *et al*., 1998; Slevin and Covin, 1997). These studies have predominantly examined the influence of one or two selected contextual factors on strategy process characteristics and on the relationship between the strategy process and performance. In this way, they have been able to test specific hypotheses using statistical techniques, that is, theory–testing or validation, mainly via the

deductive route. In a similar vein, several MS studies have also statistically tested hypothesised relationships between organisational factors (such as organisational culture and the size of the firm), manufacturing/operations strategies (such as MS archetypes and content) and manufacturing/operations performance (Aranda, 2002; Bates *et al*., 1995; Ghobadian and O'regan, 2002; Nahm *et al*., 2004).

It has long been recognised that contextual factors can influence MS processes, but researchers have only recently begun to empirically examine these influences. For example, Barnes (2002) found that "individual" (such as personalities, knowledge and expertise), "cultural" (such as collective beliefs) and "political" (such as the exercise of managerial power) factors influenced the way managers interpreted the impact of external and ownership factors on manufacturing decisions and actions. Rytter and colleagues (2007) found further evidence to confirm the influence of "cultural" and "political" factors on OS processes which they claimed were underpinned by "continuing dialogue and action". Collectively these studies have mapped the influence of contextual factors on MS processes at a broad level of analytical abstraction, although not to the extent that the relationships could be validated through statistical techniques. That represents a limitation in the understanding of the relationships between the contextual factors and MS processes.

This study has endeavoured to advance this understanding by way of further exploring the associations between certain contextual factors and alternative forms of MS formation. Being an exploratory study aimed at contributing to theory–building, it made no attempt to examine the direct and moderating relationships between the two sets of variables as has been reported in strategy process research. Neither did it aim at explaining the influence of contextual factors per se (that is, why such relationships exist). Instead, the study has revealed the salient internal and external contextual factors that emerged through the interviews and the likely ways in which those factors influence MS formation. The findings, presented in Chapter 5 in the form of theoretical propositions, helped establish the dynamics of MS formation in its broader context. At a more abstract level, the influence of contextual factors can also be interpreted with reference to the three conceptual schemas presented.

Apart from the individual, political and cultural dimensions, this study explored the influence of several other contextual factors as well. They included internal contextual factors such as the size of the firm, stage of firm development and organisational structure and external contextual factors such as competitive rivalry and market conditions. In general, the individual, cultural and political factors, along with the organisational structure, were found to have influenced the ways in which strategic initiatives progressed across the four phases, whereas the two external factors were strongly linked to the mode of initiation. In addition, the nature of strategic issues confronted in each initiative was also closely linked to the external contextual factors. For instance, most of the initiatives pursued by the top management that fell within the Conceptual Schema 1 were driven by competitor moves, regulatory requirements and the directives from headquarters which, in turn, were influenced by the degree of competitive rivalry and market conditions. Because the path of progression was, to a large extent, dependent on the mode of initiation and the nature of initiatives, the external factors played a significant role in determining the form of MS formation. Apart from these external factors, the three organisational factors, firm size, stage of firm development (maturity) and ownership, were also found to have directly influenced the form of MS formation.

6.3.3. Broader Aspects of the Manufacturing Strategy Process

The early conceptualisations of MS have emphasised the hierarchical links between company strategy, competitive priorities and the MS (Skinner, 1989; Wheelwright, 1978). For example, Skinner (1969) advocated that the MS process should be "an orderly process or a sequence of steps" and one that "must stem from corporate strategy" (p. 144). However, later contributions have emphasised the need for ensuring coherence and congruence between business strategy, MS and other functional strategies, as well as the need for developing manufacturing strategies within the overall framework of business strategy, or in a way that supports business–level strategy (Hayes and Wheelwright, 1984). In addition, business strategy researchers have used "procedural" rationality as opposed to "substantive" rationality in describing strategy processes. The former has been interpreted as the "extent to which the decision process reflects a desire to make the best decision

possible under the circumstances" (Dean and Sharfman, 1993: p. 589) and the latter has been interpreted with regard to the concept of utility (or profit) maximisation attributed to the traditional economic model (Bartlett, 1988; Shubik, 1958). The distinction between the two has often been viewed as a dichotomy between "process" and "choice".

The dual aspects of hierarchical order and rationality have also been the key tenets of the dominant normative approach to MS. Rationality, for the purpose of this study, was interpreted with connotations of objectivity, comprehensiveness and the systematic nature of decision–making and action–taking processes. The extent of rationality, in turn, was determined based on the evidence relating to documented practices and procedures, the use of quantitative data and/or explicit criteria as used in the analysis and/or evaluation of strategic initiatives and the analytical rigour reflected in such processes. This interpretation is broadly consistent with the procedural rationality cited in strategy literature (Dean and Sharfman, 1993; Simon, 1979). Accordingly, the highest degree of rationality found in this study was attributed to Conceptual Schema 2 (in Chapter 5).

Overall, the patterns of decision–making and action–taking constructed in this study reflected a relatively high degree of hierarchical order and a significantly low level of rationality. With regard to the organisational structure (actor–specific), the hierarchical order observed in this study can be more accurately described as "top–down and middle–up–down" as opposed to strictly "top–down". In contrast, the "bottom–up" perspective cited in some literature was rarely evident in the organisations studied. Moreover, the causal relationships between business strategy, MS and strategic manufacturing decisions and actions were found to be far more sophisticated than what could be described by simple hierarchical links. They can be better represented by layered networks of linear, interactive and iterative links that are shaped by the influence of certain internal and external contextual factors. The deeper structures of MS formation depicted in the data displays (schematics) used in this study can only partially illustrate this complexity.

Considering the hierarchical relationship between business strategy and MS, some authors have postulated that the external contextual factors should be addressed as part of

developing the business–level strategy. For instance, Mills and colleagues (1995) discussed their framework for the design of MS processes, assuming that " …the main impact of sectoral, national and market factors enters the MS process from business strategy and objectives… " (p. 41). However, this study found that this might not necessarily be the case in practice. On the one hand, many case companies did not have an explicit MS process in place and, therefore, strategic manufacturing decisions and actions were embedded in the overall strategy. On the other hand, operations managers directly felt (and often intuitively responded to) the impact of such external factors as competitive pressure, shifting market conditions and changing customer needs, regardless of the emergent or deliberate nature of strategy formation.

In the business strategy area, empirical studies have uncovered a number of organisational situations that undermine the rational planning logic. For instance, Hambrick and Mason (1984) postulated the influence of the demographics of upper echelons on organisational outcomes. Eisenhardt and Bourgous (1988) explored the role of politics as "observable, but often covert, actions by which executives enhance their power to influence decisions". While borrowing from others, they elaborated that "these actions include behind the scene coalition formation, offline lobbying and co–optation attempts, withholding information and controlling agendas" (pp. 737–738). More recently, Cooksey (2000) summed up the practical implications of pursuing a universal rational planning approach to strategy as follows: "acquainting managers with simplified and frequently tightly codified decision procedures creates giant blind spots to the contextual constraints and influences imposed in naturalistic decision contexts" and he added that "the study of decision making must be contextualised before serious theorising and understanding can occur" (pp. 103–194).

Traditionally, content and process aspects of strategy have been studied separately and there have been numerus calls for doing away with this artificial dichotomy (Campbell and Alexander 1997; Feurer and Chaharbaghi, 1995; Huff and Reger, 1987; Pettigrew, 1992; Prahalad and Hamel, 1994). Moreover, the debate on emergent and deliberate strategy appears to have divided strategy scholars into two exclusive schools, thus (mis)leading the readers to believe that strategy does or should exist in one mode or the

other (Andersen, 2004). In some extreme cases one form is depicted as superior to the other in universal terms. The findings of this study that are grounded in empirical data shed some light on the above issues, as briefly outlined below.

The conceptual model recognises the "commitment" phase as a junction (a point of convergence–divergence) between the "consolidation" phase and "realisation" phases. In a way, this corresponds to a subtle (and perhaps a naturally occurring) distinction between the concepts of strategy formulation and strategy implementation that have been captured in normative models, although it is not as abrupt as what has been claimed by the advocates of formal planning.

As strategic initiatives are evoked by a number of stimuli, under the influence of a multiplicity of contextual factors, the co–existence of secondary forms of strategy formation alongside a dominant form and the likely routes those different strategic initiatives follow (believed to be unique to each organisation) are also supported by the above findings. As such, the possibility of deliberate and emergent forms of MS formation within a single entity, as has been found in recent empirical studies, can be explained with the help of these findings. For example, Hart and Banbury (1994) claimed that "it may be more valid to think of organisations as entities capable of developing resources and skills in multiple strategy–making process modes" (p. 251).

Overall, the findings of this study corroborated, contradicted, or extended the findings of previous MS process studies. The ways in which competitive priorities are arrived at were broadly consistent with the finding of extent literature, albeit in a less–hierarchical order. The ways in which competitive priorities were translated to manufacturing decisions and actions were messier and more subtle than suggested in a number of earlier MS studies, but were largely consistent with the findings of most recent MS studies. The key patterns of MS formation were much more sophisticated than what were found in most studies, but supported and extended the findings of the few more recent studies. The tentative links between certain contextual factors and the forms of MS formation developed in this study extended the current understanding of the influence of contextual factors on MS formation.

6.4. Progress and Penetration of the Manufacturing Strategy Concept in the Industry

This study, at the outset, established two facets of the research problem: a lack of collective understanding and agreement on how to operationalise the existing MS/OS concepts; and a lack of comprehensive understanding of the dynamics of MS/OS formation in practice. These problems, in turn, were cited as the major causes of a lack of progress and penetration of the MS concept in the industry.

Findings of this study have confirmed that these problems still persist, although, arguably, to a lesser extent than they would have some years ago. It was found that: the strategic manufacturing decisions and actions are not necessarily driven from competitive priorities; there are no clearly articulated frameworks for guiding strategic manufacturing decisions and actions, particularly, at the lower levels of management; and the manufacturing's contribution to developing and/or agreeing on competitive priorities is very limited. These observations indicate the limited contribution that has been made by previous MS process research in addressing these longstanding problems and the limited impact of the past prescriptive approaches on MS practice. They further remind researchers of the challenges that lie ahead of them in terms of finding innovative ways of addressing these problems.

It was further revealed that in the case of large organisations, there is a major challenge for the subsidiary unit and local plant management with regard to reconciling the expectations of the headquarters and the requirements of the local markets, as well as satisfying other local conditions such as organisational culture, regulatory regimes and economic factors. This issue may be of major significance to OM researchers, given the changing landscape of manufacturing in the context of shifting customer preferences, the rationalisation and global integration of manufacturing businesses in the light of low–cost production in emerging economies and the new challenges brought about by the climate change imperative. These developments may also further challenge the validity and/or relevance of traditional normative approaches to MS development. It is expected that the findings of this study, which provide some rich insights into the dynamics of MS formation in practice, will contribute to understanding, explaining and addressing these problems. It is

further expected that this study will add momentum to the recent shift in MS process research marked by the studies of Barnes (2002), Rytter and colleagues (2007) and Swamidass and colleagues (2001), which have endeavoured to conceptualise MS processes using rich methodological approaches, leading towards the development of a more comprehensive alternative model of MS formation in practice.

6.5. Value of Using Qualitative Approaches in Investigating MS Processes

The findings of this study also demonstrate the value of using qualitative approaches in general and the combined case–study and grounded–theory approach in particular in investigating MS formation in practice. Distinctive outcomes of the seven closely related studies of MS process referred to in this chapter are explained by: the differences between the chosen research questions; the unit of analysis/level of analytical abstraction reflected; and the methodological approaches and the specific methods of data collection and analysis applied to each study.

All seven studies have aimed at exploring MS formation processes in practice, although the level of analytical abstraction reflected in each study was quite different. Studies by Cheng and Musaphir (1996), Deshmukh and Dayangh (2001) and Marucheck and colleagues (1990), have all used research questions that were heavily biased toward the rational planning approach and the MS process was captured at a highly abstract level. Kim and Arnold (1996), having noted this as an impediment to operationalising the MS concept, have developed a less abstract model, although it has still fallen within the normative framework. Research instruments such as structured interviews in a public setting (conference) and questionnaire surveys used in these studies could have also limited the possibilities of capturing more informal and emergent forms of MS formation.

In contrast, Barnes (2002) and this study have both focused on organisational processes relating to strategic decision–making and action–taking and therefore have used research questions that allowed exploration of both the deliberate and emergent forms of MS formation. Both studies have been able to develop deeper insights into MS formation

processes in practice in the form of patterns in streams of decisions and actions. In addition, guided by the grounded theory techniques, this study constructed deeper structures of MS formation with some causal understanding.

By comparison, while employing a combined action research and longitudinal case study approach, Rytter and colleagues (2007) have also provided useful insights into OS processes. But the way in which the findings were interpreted was quite different from that of the above two studies. This difference could mainly be attributed to the settings under which that study was conducted and the particular research design used. Furthermore, the unique characteristics, as well as the inherent limitations and biases attributed to the chosen research approach may also have influenced the style and format of presentation. For example, notwithstanding their superior ability in providing deeper insights and establishing causal relationships, a longitudinal *single* case study may not allow capturing recurrent patterns across multiple settings.

The high degree of consistency between the findings of Barnes (2002) and this study strongly supports the "reliability" of the methodological approach adopted. The differences with regard to the level of detail provided and the causal understanding developed are explained by the differences in the number of case studies, the data analysis techniques and the display formats used.

Some differences and similarities across the seven empirical studies referred to above can also be attributed to the research frameworks used. The findings, to some extent, and the way they are interpreted, to a greater extent, are influenced by the particular world view adopted (for example, positivist vs. interpretivist), the relationship between the researcher and the researched (objective vs. subjective) and the dominant research tradition within the discipline area concerned. For instance, if an investigator entered the field with the aim of discovering some "truth that exists out there" about a certain socio–technical phenomenon within a certain entity (for example, an organisation), the nature of that person's findings would be quite different from that of someone who entered the field wanting to understand the same phenomenon in the context of social interactions observed

within that entity as they are experienced by the actors involved. As such, it can be reasonably expected that the research methods used and the ways in which findings are presented would also be substantially different across those two situations.

6.6. Chapter Summary

This chapter has compared, contrasted and contextualised the findings of this study against those of a selected body of extant literature. The sample of case companies used in this study provided further empirical evidence to support the dynamic and complex nature of MS/OS formation and the alternative forms of MS processes found in several previous studies that have used similar samples from other regions of the world.

The findings of this study also provided contradictory evidence in relation to some other findings of the cited studies. The direct and intermediary role of marketing strategy in the MS process and the strictly hierarchical causal links between the elements of strategy development depicted in existing models were not supported by the findings of this study. The hierarchical order observed in this study has been described as "top–down and middle–up–down", which can be better presented as layered networks of linear, interactive and iterative links that are shaped by a variety of contextual factors.

This study found that, apart from a formally recognised business strategy or agreed–upon strategic directions, a number of other factors can alter the mix of competitive priorities and/or their relative importance. It was further observed that: the strategic manufacturing decisions and actions were not necessarily driven from competitive priorities; there were no clearly articulated frameworks for guiding strategic manufacturing decisions and actions, particularly at the lower levels of management; and the manufacturing's contribution to developing and/or agreeing on competitive priorities was limited. A few recent studies have mapped the influence of contextual factors on MS processes at a broad level of analytical abstraction. This study has further advanced this knowledge by way of developing some tentative relationships between alternative MS processes and certain contextual factors to an extent that they could be statistically validated.

CHAPTER 7: CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

7.1. Introduction

This thesis reported on an empirical investigation into MS formation in practice. The broad objective was to advance the understanding of MS processes through construction of underlying patterns of decision–making and action–taking relating to the manufacturing structure and infrastructure of the organisations studied. This chapter concludes the thesis with a summary of the research effort, conclusions on the research questions and some reflections on the implications of the findings, including their limitations.

7.2. Summary of the Research Effort

The literature review, which established the theoretical context for the study, covered three major areas of scholarly work – business strategy, manufacturing strategy and research methodology. The review of business strategy literature revealed that the area has grown from a narrowly focused one dominated by normative thinking to a more encompassing and robust field of its own. Strategy process research, in particular, has not only drawn from other more mature disciplines such as sociology, psychology, biology, and economics but also has embraced rich methodological approaches. They have examined a wide range of topics and issues pertaining to the individual behaviour, organisational processes and contextual factors associated with strategy formation, including their links to organisational performance. The findings have been presented in the form of descriptive and analytical frameworks and conceptualisations reflecting varying levels of abstraction. Moreover, several leading scholars in the field have recently identified new opportunities for research while advocating important perspectives that would further enhance both the rigour and relevance of strategy process research.

In contrast, despite a growing interest in scholarly work, MS researchers have continued to grapple with the fundamental problem of "the lack of progress and penetration of the MS concept in the industry". Historically, MS process research has overwhelmingly relied on

normative conceptualisations. As such, the vast majority of the research undertaken in the area has been guided by positivist thinking and the resultant conceptualisations of MS processes have been presented at highly abstract levels. Consequently, there have been no clearly articulated alternative process models and frameworks of MS reported in literature. A lack of deeper understanding of MS processes, which can be partly attributed to the absence of such alternative models and frameworks, has contributed to the slow progress and penetration of the MS concept within the industry. However, a few recent empirical studies were found to have challenged this long–standing tradition. These empirical studies have collectively claimed that the many ways in which MS/OS is formed in practice can be neither accurately captured nor adequately explained by the top–down rational planning model alone. In addition, they have provided useful insights into MS processes in practice highlighting the pluralistic nature of the successful manufacturing strategies pursued by different firms while exploring the influence of several organisational factors on MS/OS processes. However, these studies were found to have fallen short of articulating an alternative framework of MS formation in aggregate terms.

Overall, the literature review revealed that compared to the rich and comprehensive process understanding that has been achieved in strategy research, process understanding within the MS/OS domain was very limited. Given the nature of the research problem and the extent of prescriptive work that has already been carried out within the normative framework, it was apparent that the potential contributions to theory and practice that can be made through the further advancement of top–down planning approaches would be limited. Alternatively, it was assessed that the most effective contribution towards addressing the research problem could be made through explicating deeper structures of MS formation in practice (i.e. based on empirical data) in order to augment the limited understanding provided by the existing normative frameworks. To this end, the literature review synthesised the currently available knowledge on MS processes into a conceptual framework, which, in turn, was used as the basis for designing the field research component of the study.

The conceptual framework depicted the multiple dimensions and complexities associated with the MS process. It acknowledged a number of assertions relating to the MS process that have been reported in the literature. The framework also demonstrated that the existing knowledge of MS processes did not extend beyond identifying categories, concepts and broad constructs such as priorities, objectives and action plans and their macro–level linkages. It did not reflect the intertwined nature of strategy formulation and implementation, or the non–linearity of the strategy formation process that have been widely accepted in the strategy process literature. Building on this knowledge, the study was designed to address the following research questions:

– How are competitive priorities arrived at and translated into decisions and actions relating to manufacturing structure and infrastructure?
– What are the consistent patterns of manufacturing strategy formation within specific organisational contexts and why those patterns exist that way?

These research questions reflected the exploratory nature of the study while recognising both the deliberate and emergent forms of MS formation. They aimed at capturing MS processes "as holistically as possible" while operating at a lower level of analytical abstraction (compared to previous studies) with a view to developing deeper insights. The methodological approach was chosen with particular attention to the analytical rigour, as well as the flexibility required in pursuing this goal. The review of methodology literature revealed that the capacity to develop rich insights into MS formation was largely constrained when researchers exclusively relied on traditional positivist approaches that contained such research instruments as questionnaire surveys and structured interviews. In strategy process research such limitations had been overcome by using qualitative approaches and mixed–methods. After reviewing the qualitative and quantitative methodologies that had been used in previous MS and strategy process research, this study decided in favour of a combined case study–grounded theory approach. This combined approach allowed the pursuit of "deeper insights in aggregate terms" within the limitations imposed by the wider issues such as resource constraints and access to data.

Informed by the conceptual framework, nine case organisations were selected considering especially the context–dependent nature of the MS process, in order to support the replication logic aimed at analytic and theoretic generalisations. The key process attributes of interest were initiation, participation, progression and realisation of strategic initiatives along with the sequences of actions, decisions and events, including their temporal dimension. Interviews, conducted with management staff were recorded, where allowed, and were subsequently transcribed into text. In cases where there were documented strategic plans, they were used as additional sources of data along with the other documents containing relevant company information. The write–ups were first disaggregated and re–organised using descriptive codes to identify chunks of text representative of the above process parameters. They were then re–aggregated and re–packaged using higher–level inferential codes in order to construct more abstract conceptual schemas. The findings were presented in the form of textual descriptions and explanatory accounts aided by several data displays, leading towards the explication of deeper structures of MS formation.

Overall, the field study explored the deeper structures in MS formation processes in practice. These deeper structures were conceptualised in the form of linear and parallel, converging and diverging, sequential and iterative progressions of strategic initiatives across four broad phases identified as initiation, consolidation, commitment and realisation. The alternative forms of MS formation depicted the intertwined and embedded nature of the deliberate and emergent forms as well as the more rational and less rational elements of MS formation. The multiple modes of strategy initiation, alternative paths of consolidation and differing forms of commitment and realisation were explained in terms of the nature of strategic initiatives, the causal relationships between the modes/phases themselves and the influence of certain organisational contextual factors. These relationships were presented in the form of a series of theoretical propositions.

7.3. Summary of Findings and Conclusions on the Research Questions

This study aimed at exploring deeper structures of MS formation processes. The overall findings have been presented in the form of a conceptual model depicting those deeper structures and several theoretical propositions along with other general observations relating to the MS process and content.

The deeper structures of MS formation constructed in the study represent linear and parallel, converging and diverging, sequential and iterative progression of initiatives across four phases identified as initiation, consolidation, commitment and realisation. They also depict the intertwined and embedded nature of the so–called deliberate and emergent forms, as well as the more rational and less rational aspects of MS formation. The multiple modes of strategy initiation, alternative paths of consolidation and differing forms of commitment and realisation are explained by the nature of strategic initiatives, the causal relationships between the modes/phases themselves and the influence of certain internal and external organisational contextual factors.

In general, the individual, cultural and political factors, along with the organisational structure, were found to have influenced the ways in which strategic initiatives progressed across the four phases, whereas the two external factors were strongly linked to the mode of initiation. The nature of strategic issues confronted in each initiative was also closely linked to the external contextual factors. Apart from these external factors, the three internal factors – size of the firm, stage of firm development and ownership – were also found to have directly influenced the form of MS formation.

Overall, the patterns of decision–making and action–taking constructed in this study reflected a relatively high degree of hierarchical order and a significantly low level of rationality in MS formation processes. The relationships between business strategy, MS and strategic manufacturing decisions and actions were far more complex than what could be described by simple hierarchical links associated with the organisational structure.

They can be better presented as layered networks of linear, interactive and iterative links that are shaped by certain internal and external organisational contextual factors.

As strategic initiatives are evoked by a number of stimuli, under the influence of multiple contextual factors, the co–existence of secondary forms of MS formation alongside a dominant form and the likely routes those different strategic initiatives follow (believed to be unique to each organisation), are also supported by the above findings. As such, the possibility of deliberate and emergent forms of MS formation within a single entity, as has been found in recent empirical studies, can be explained with the help of these findings.

When enfolded in extant literature, these findings make two major contributions towards advancing the current understanding of MS processes. Firstly, apart from corroborating the complex and dynamic nature of MS formation in practice, it explicates the key process parameters/attributes and the alternative forms of MS formation. Secondly, it explores the relationships between alternative modes of MS formation and certain contextual factors, and establishes some causal links. This deeper understanding will feed future MS/OS research, leading to the development of a plausible mid–range theory of MS processes. It will also help practicing managers to better understand and manage MS processes and to nurture appropriate forms of MS formation within specific organisational settings.

Having recognised the pervasive nature of the research problem and the limited empirical understanding of the phenomena subject to investigation, this study started with two broad and relatively open research questions. However, throughout its course, the study was tightly held together by its objective – exploring deeper structures or underlying patterns of MS processes in practice. Starting with the conceptual framework, the field study progressively improved its focus, leading towards deeper level analytical insights, mainly through purposive sampling and iterative data collection and analysis – meaning that new lines of inquiry and new sources of data were pursued in the progressive rounds of interviews and new cases – facilitated by constant comparison and progressive reflection.

As the two research questions aimed at addressing the two facets of the research problem, the findings were also presented in the same format – and it is well within custom to do so. However, in the light of the findings of this study this seems somewhat artificial given that the different perspectives such as deliberate vs. emergent and rational vs. evolutionary were found to be intertwined or co–existing in practice. Similarly, the externalisation of the contextual factors in the form of a matrix and the presentation of the findings using rather concrete terms–using a conceptual model could, potentially, not only contravene some of the esteemed conventions in "purist" qualitative research, but also undermine, to some extent, the value of rich insights developed in the study. However, these measures were deemed necessary in order to fulfil several other requirements of the study that have been already discussed in some detail in Chapter 3 and elsewhere in this thesis.

In respect of the first research question, it was observed that the notion of competitive priorities was either implicitly or explicitly recognised by all organisations studied, with a high degree of consistency. There were only minor variations in the way they were perceived by the managers across different organisations, and/or compared to the terminology commonly used in the MS/OM literature. Competitive priorities were primarily derived from the business–level strategy or strategic direction, again, either implicitly or explicitly, depending on the degree of formality observed in strategy formation processes. However, there was clear evidence to suggest that competitive priorities were not always driven or guided by business–level strategy, as a significant number of strategic initiatives were found to have been triggered/influenced by forces outside the recognised competitive priorities. As such, it can be inferred that while there is wide recognition of (and consensus on) the dimensions of competitive priorities and their significance as the basis of competition, they are not always established through formal analytical processes. The ways in which competitive priorities were translated into manufacturing decisions and actions were found to be predominantly based on managerial interpretation and intuitive judgement, through a range of mechanisms with varying degrees of formality. The large number of strategic initiatives that were formed outside the mainstream framework and the ways in which they progressed and realised suggest that new competitive priorities can be formed without formally recognising them in advance

and that the dimensions of competitive priorities do change over time. These revelations may have significant implications for both theory and practice.

With regard to the second research question, the findings of this study explicated the deeper structures of MS formation and provided explanatory accounts of those structures, and they have been discussed in detail in Chapter 6. When enfolded in extant literature, these findings provide a cohesive body of conceptual knowledge about the ways in which MS is formed in practice while articulating the alternative forms of MS formation under varying organisational settings. This conceptual understanding is expected to make a useful contribution towards addressing the key research problem identified in this study.

Based on the substantive findings of this study, it can be concluded that, in practice, MS is formed through complex, dynamic and iterative, largely intuitive yet predominantly hierarchical organisational processes under the influence of certain internal and external organisational factors. The underlying patterns of these processes, including their causal links, can be delineated by examining the strategic manufacturing decision–making and action–taking within their naturalistic contexts. This can be achieved using novel methodological approaches and through the concerted/cumulative efforts of researchers. As has already been discussed, the findings of the three most recent empirical studies have marked a fundamental shift in the way MS formation is conceptualised. They have not only confirmed, with empirical evidence, the equifinality, but also have provided valuable insights into the dynamics of MS formation. In light of the observations reported in this study, it is of paramount importance, to the progress of the field, that researchers convert this start to a critical mass of empirical studies leading towards the development of a plausible mid–range theory of MS formation, strongly grounded in empirical data.

As such, the findings of this study make a worthwhile contribution towards achieving this goal. Apart from corroborating the key findings of the recent studies, the deeper structures of MS formation constructed in this study were found to be useful in explaining those findings. Furthermore, they provide a strong foundation for guiding future studies, which along with some other contributions are discussed in more detail in the following section.

7.4. Implications for Theory, Practice and Future Research

The findings of this study further advance the MS process understanding that has been developed through the recent empirical studies by way of providing more detailed and explanatory accounts of MS formation, grounded in empirical data. The deeper structures of MS formation explicated in this study, in particular, are expected to contribute to theory, practice and future research as outlined below.

Notwithstanding its limited relevance to practice, the normative thinking has had a pervasive influence on MS research and teaching for well over three decades. MS process research has only recently acknowledged the complex and dynamic nature of MS formation processes and the existence of successful alternatives to the formal planning approach, in practice. Compared to the current state of knowledge in strategy process research, this understanding of MS process is disappointingly limited. This study made a concerted effort in further exploring the underlying patterns of MS formation in practice towards advancing this limited understanding. Therefore, its contribution is to theory building as opposed to theory validation or theory extension. By way of explicating the deeper structures of MS formation in practice, the findings of this study corroborated and explained the findings of several previous studies. Given the small number of published empirical studies available and the typical small sample size used in qualitative studies, corroborating (and/or disputing) the findings about the same (emerging) phenomenon using empirical evidence from different samples can be treated as a worthwhile contribution to knowledge. Providing plausible explanations on those observations (differences and similarities) makes that contribution significant.

Therefore, on the scholarly front, the deeper understanding of MS processes developed in this study contribute to theory building with the added significance that this study successfully crossed the traditional analytical boundaries. As such, the grounded process model developed in this study demonstrates potential for developing into a plausible building block of theory with strong explanatory power.

From practitioners' point of view, the process knowledge developed in this study may help organisations better manage the MS process in a number of ways, as has been claimed by strategy process scholars. Organisations can use the process understanding for such general purposes as facilitating migration from emergent to deliberate (if desired) by way of helping them identify and address potential implementation issues associated with the formal planning model while leveraging on the strengths of the emergent approach. Practical aspects such as the use of appropriate communication and/or strategy dissemination mechanisms in each form of process, preparing for and devising appropriate measures for dealing with (employee) resistance will also be informed by the findings of this study. Similarly, management can make informed decisions on how to devise performance measures and link performance management systems to strategy under each form of MS formation.

However, the most fundamental contribution to practice that can be derived from the findings of this study rests in addressing the issues cited by Skinner (1992); lack of leaders who understand and accept the new concepts, problems in middle management and problems with the ideas of MS. If the most critical impediments to the penetration and progress of the MS concept in the industry are summed up as "biological rejection" (Skinner, 1992), then no amount of prescriptive models, techniques and tools would help remedy that intrinsic lack of appeal. Conversely, the most effective way of removing those impediments would be through enhancing the conceptual understanding, among practitioners, of the dynamics of MS formation. The findings of this study are expected to fulfil that requirement. The conceptual model and accompanying descriptions and explanations are grounded in empirical data. The model itself is presented using simple formalisms yet is capable of providing rich insights in aggregate terms. As such, this model is expected to hold a natural appeal to practitioners, mainly due to its simplicity, grounded nature and its relatively strong explanatory power. Furthermore, if these findings can find their way into OM/MS pedagogy, they would make even a more substantial and progressive contribution to MS practice by helping to educate practitioners.

The findings of this study along with those of recent empirical studies referred to earlier open up many new avenues of future research. Given the analytical abstraction used in this study, they can feed into the studies examining micro–level issues such as the impact of organisational culture and managerial styles as well as the studies aimed at statistically validating the causal links between the alternative forms of MS formation, contextual factors and operations performance.

The conceptual framework developed in this study can be extended to investigate strategy formation in relation to both supply chain and stakeholder perspectives. The deeper understanding of OS formation developed in this study is expected to provide a sound platform for future studies that investigate OS from the above perspectives.

Overall, this study demonstrated the value of looking beyond the dichotomous terms towards embracing a more holistic, sophisticated and a naturalistic view of MS and using more innovative and rich methodological approaches. There had been multiple calls for abandoning the dichotomous approaches to strategy research (Hart and Banbury, 1994; Huff and Reger, 1987; Cooksey, 2000) and a similar call by Barnes (2002) "to abandon what is often a one–dimensional (top–down rational planning) view of the MS process and embrace the multidimensional thinking of corporate strategists" (p. 1106).

Planned approaches to strategy formulation and implementation are intuitively appealing and logically consistent. They may also be theoretically favoured in turbulent markets and uncertain competitive environments, as it could be argued that preparedness would mitigate the adverse effects of uncertainty (when uncertainty is below a certain threshold). Organisations may also have to employ formal planning, as they grow bigger for such externally and internally driven reasons as accountability requirements and control–coordination–integration purposes. However, this study showed that in firms where there were clearly laid out strategies, managerial response to changes in the internal and external contextual factors resulted in other more subtle forms of MS formation. In addition, this study found further evidence to support the recent empirical findings that planned manufacturing strategies are not found to be widespread in practice. Therefore, an

interesting question that future research would need to look at is if, and under what circumstances, it would be more economical and effective to nurture the alternative forms of MS formation through creating an environment conducive to shaping those strategies towards realising a firm's strategic intent, or alternatively, to continue to find better ways of enforcing the formulated (planned) strategies through such deliberate and conscious means as structure, control, leadership and change management.

It was evident that the three forms of MS initiation and the likely routes they may progress along would be influenced by the nature of initiatives, the stimuli of initiation and the influence of certain contextual factors. Given that the findings discerned, to some extent, the relationships between forms of MS formation and the contextual factors, in future research, those relationships can be extended to see how variations in context and process could explain different performance outcomes. This would involve identifying the most appropriate forms of MS formation processes under specific circumstances (internal–external contextual factors) and relating those alternative forms of MS formation to operations performance, preferably aimed at drawing sample–to–population type generalisations (which fell beyond the scope of this study). Furthermore, hypotheses such as those given below can be tested based on the differences in operations performance:

– whether or not firms with multiple forms of MS formation perform better; and

– whether or not particular forms (or combinations) of MS formation lead to better performance under specific circumstances.

7.5. Limitations of the Study and its Findings

This study, as has already been acknowledged, aimed at contributing to theory building. Considering the limitations of some previous MS process studies, it endeavoured to explore the dynamics of MS formation "as holistically as possible" (Pettigrew and Whipp, 1993: p.7), while maintaining the required depth of analysis and a high level of analytical and methodological rigour. This required crossing the traditional analytical boundaries.

Compared to more tightly defined theory validation and theory extension research, exploratory studies aimed at theory building research present several additional challenges. Reflecting on these challenges helps identify the limitations of the findings and may contribute to future research.

When using qualitative data, there is the possibility for two types of error with interview data – inaccuracy of retrospective accounts due to deliberate distortion or due to genuine loss of memory. Although the impact of these errors was mitigated using multiple sources and iterative data collection and analysis, they can hardly be totally eliminated. Similarly, when presenting the findings in such forms as case narratives and descriptive data displays, there is the possibility for multiple interpretations. Despite specific measures such as the use of as many causal networks, matrices and other schematics as possible and providing as much detail as possible on the research procedures followed and the methods of data analysis used, alternative interpretations still remain a possibility. However, it is also important to consider these limitations in perspective as pointed out by Huff and Reger (1987) in the following statement:

> just as broadly–focused studies are often open to conflicting interpretations, the tight boundaries that must be drawn around research questions in order to study statistically the relationship between a few variables are artificial ones that may lead researchers to misleading conclusions (p. 227).

These issues represent the trade–offs that researchers often attempt to resolve within the constraints imposed by the circumstances under which a particular study is conducted.

Notwithstanding their superiority over the quantitative techniques in developing rich insights into emerging socio–technical phenomena, using qualitative approaches in areas dominated by positivist traditions may also encounter other problems that are less prevalent in the social sciences. When attempting to satisfy the academic requirements and assessment criteria used by potential examiners with positivist allegiances, researchers may tend to adopt methods and writing styles that are representative of positivist traditions.

In methodology literature this is known as "using qualitative approaches, but succumbing to positivist tradition" and is said to be also influenced by researcher background. Despite its best efforts, this study was not completely immune to such generic flaws.

This study acknowledged, upfront, that its findings are not meant to be generalised to populations. The sample size and selection, the particular industry sectors covered and the methodological instruments used, all aimed at developing a deeper understanding of a specific socio–technical phenomenon. As such, they were not tested against the traditional positivist criteria used in studies aimed at sample–to–population extrapolation. However, that does not necessarily mean that the findings are only applicable to the particular case companies studied. A sample size of nine, in qualitative studies, is considered to be substantial and particularly useful in drawing conclusions that can be generalised to theoretical propositions (i.e. supporting an emerging theory with empirical evidence). In this study this was achieved through the application of literal and theoretical replication as explained in Chapter 3 and as demonstrated in Chapter 5. In addition, when the resultant theoretical propositions were enfolded in extant literature it further improved their generalisability. As such, the findings of this study can be extrapolated to other samples with similar characteristics and/or samples with different characteristics, if the differences can be explained with the help of the extant literature. However, in order to apply sample–to–population–type generalisations they need to be tested using much larger samples and preferably with statistical techniques.

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APPENDIX 1: EXISTING MODELS OF THE MANUFACTURING STRATEGY PROCESS
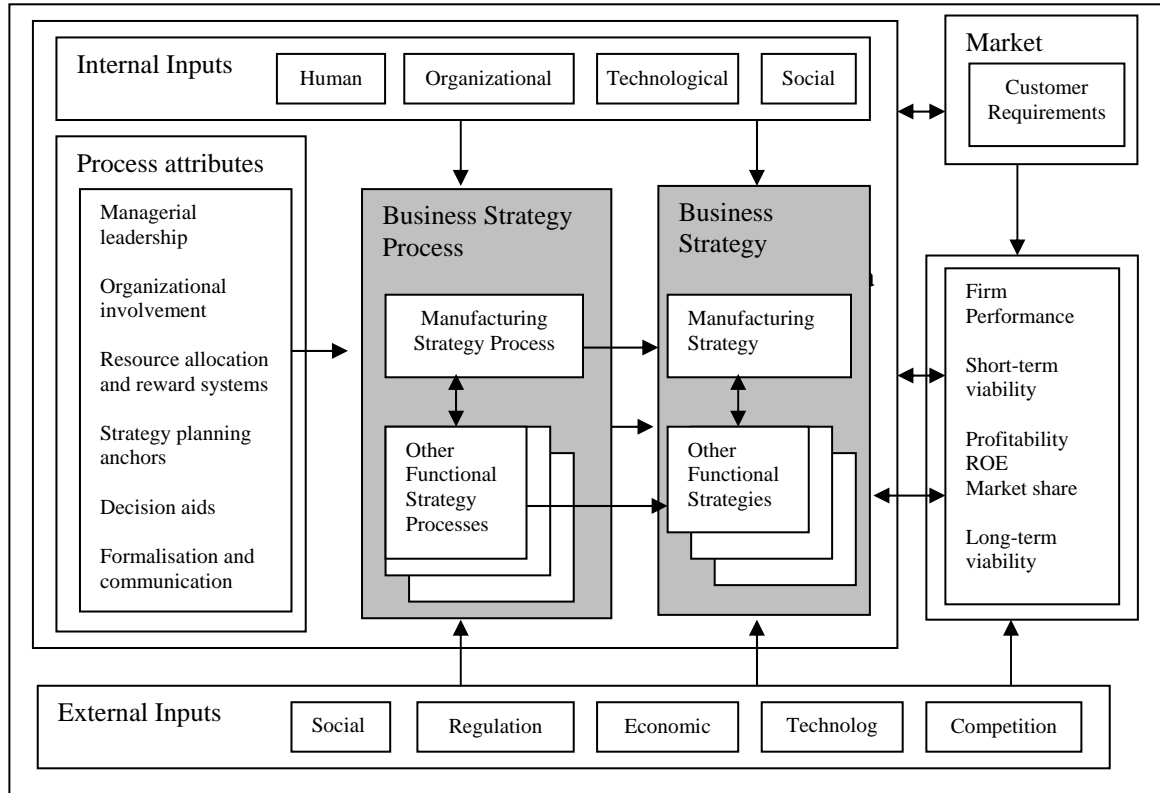
Figure A1.1: Manufacturing and Business Strategy: A Process View
(Source: Anderson *et al*., 1991: p. 89)
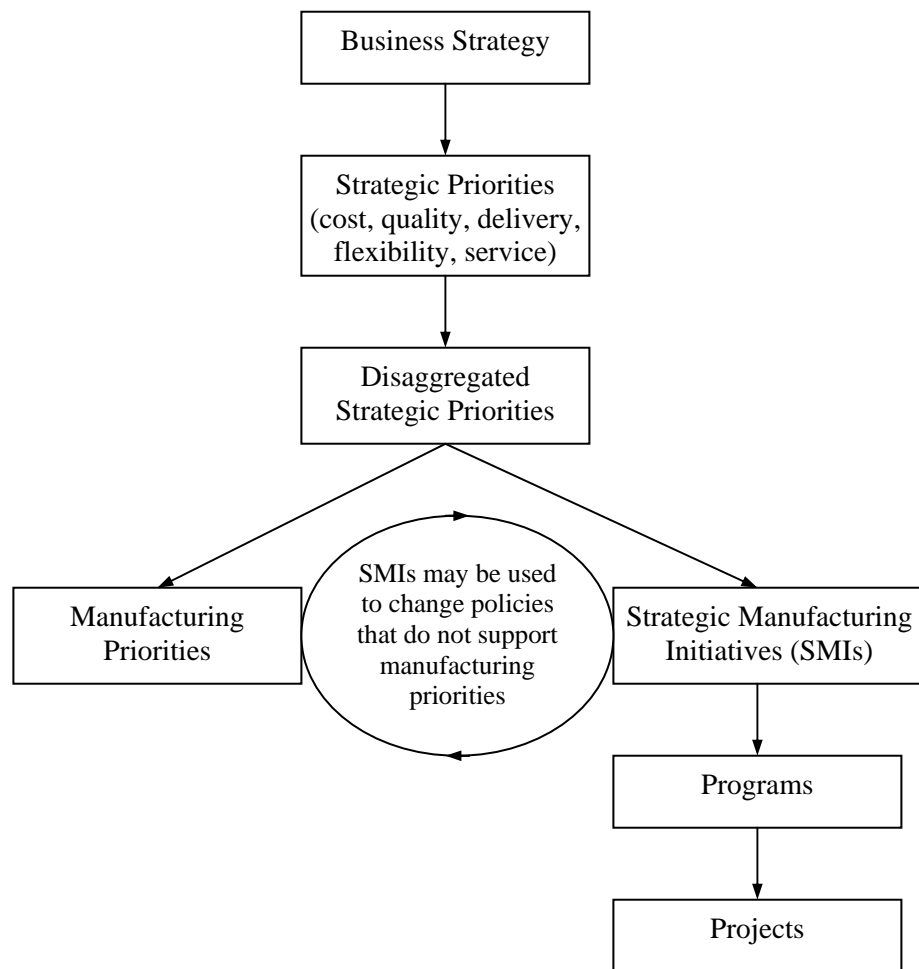
Figure A1.2: An Integrated Framework for Manufacturing Strategic Planning
(Source: Garvin, 1993: p. 91)
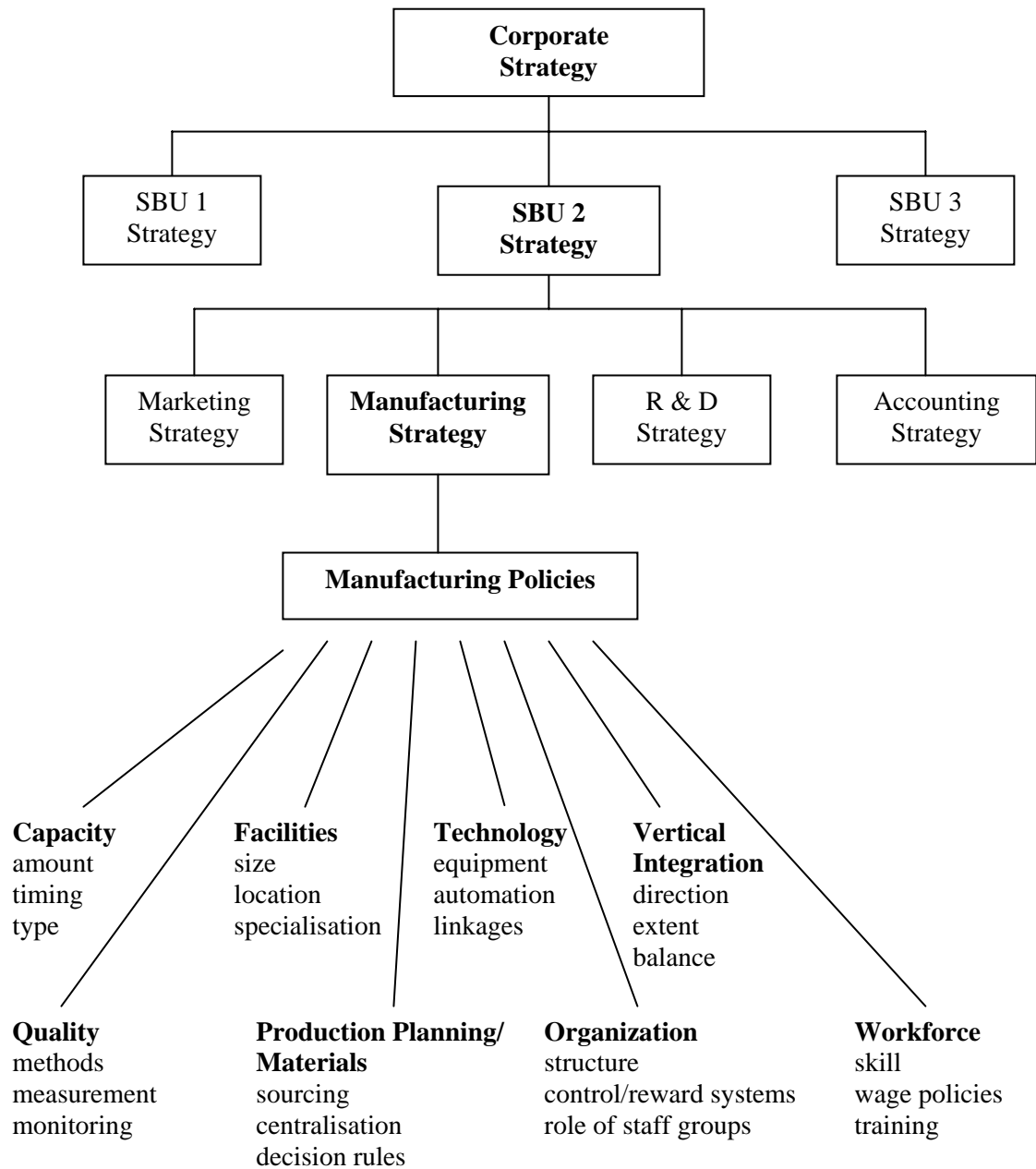
Figure A1.3: The Current Model of Manufacturing Strategy
(Source: Hayes and Wheelwright, 1984: pp. 28, 31, in Garvin, 1993: p.86)
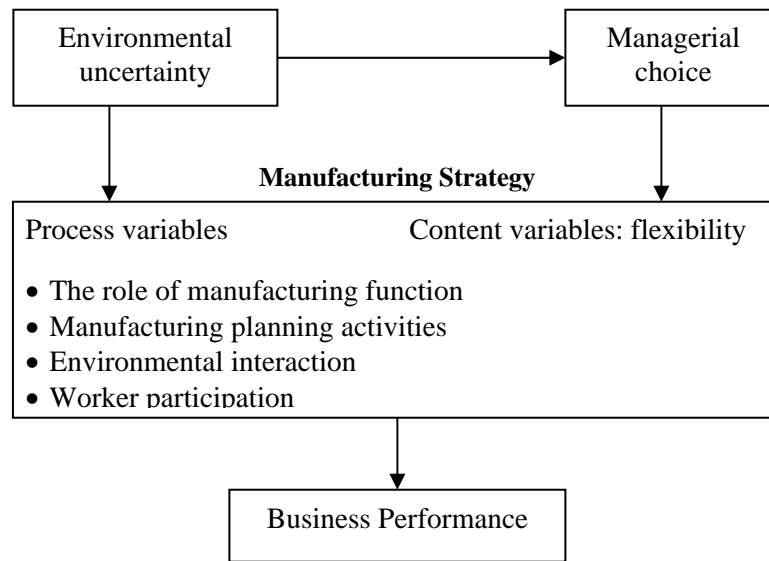
Figure A1.4: A Contingency Model of Manufacturing Strategy
(Source: Ho, 1996: p. 76)
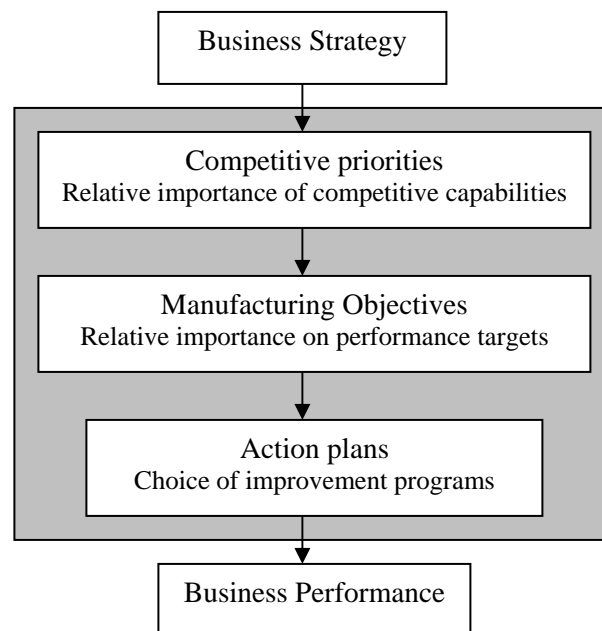
Figure A1.5: A Process Model of Manufacturing Strategy
(Source: Kim and Arnold, 1996: p. 49)

Environment

BOUNDARY

CORPORATE STRATEGY

STRATEGIC BUSINESS UNIT STRATEGIES

FUNCTIONAL STRATEGY FORMULATION

Manufacturing   Other Functional Areas

IMPLEMENTATION

Manufacturing   Other Functional Areas

CAPABILITIES

Manufacturing   Other Functional Areas

SERVICE–ENHANCED PRODUCT

Internal Performance Measures

Market Place Performance
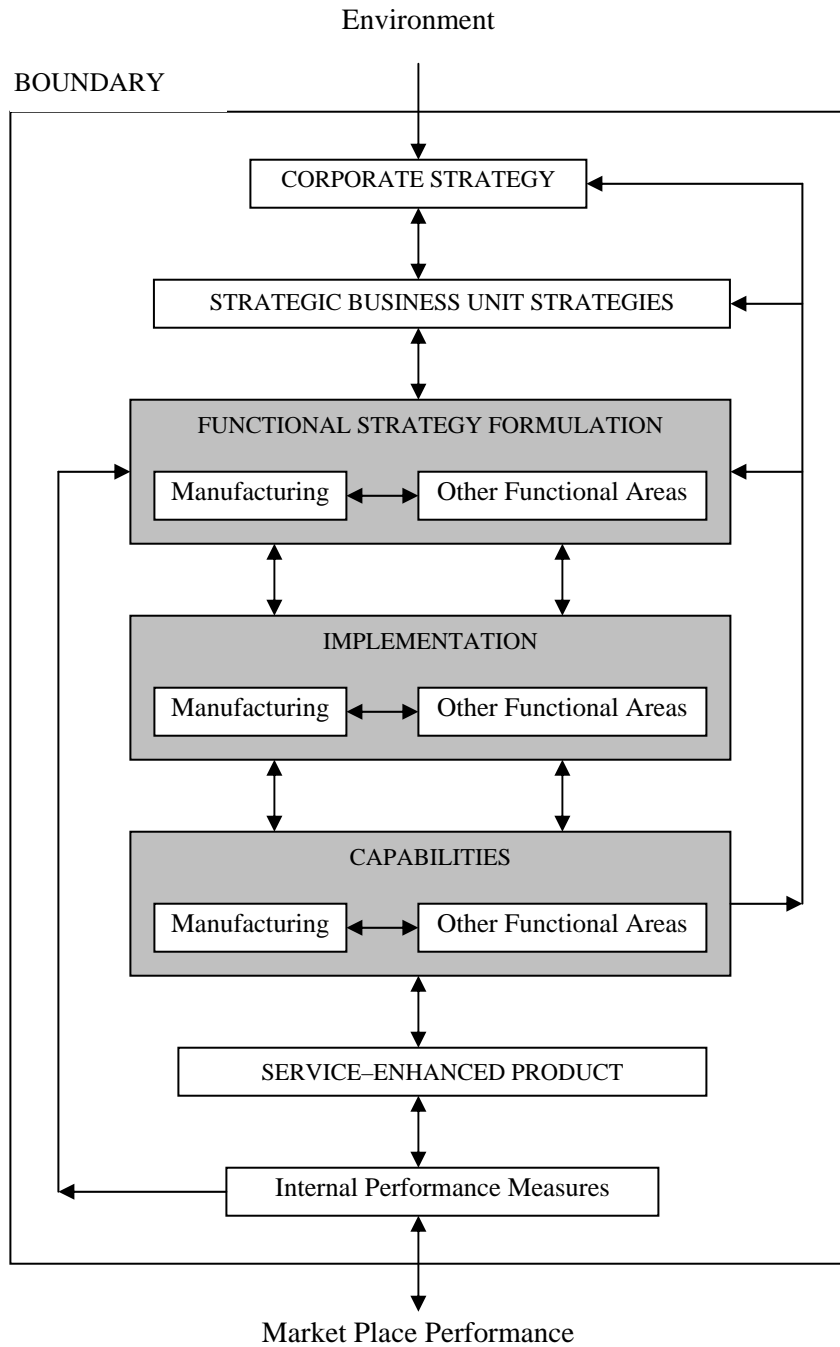
Figure A1.6: Predominant Process Model of Manufacturing Strategy
(Source: Leong *et al.*, 1989 : p. 111)
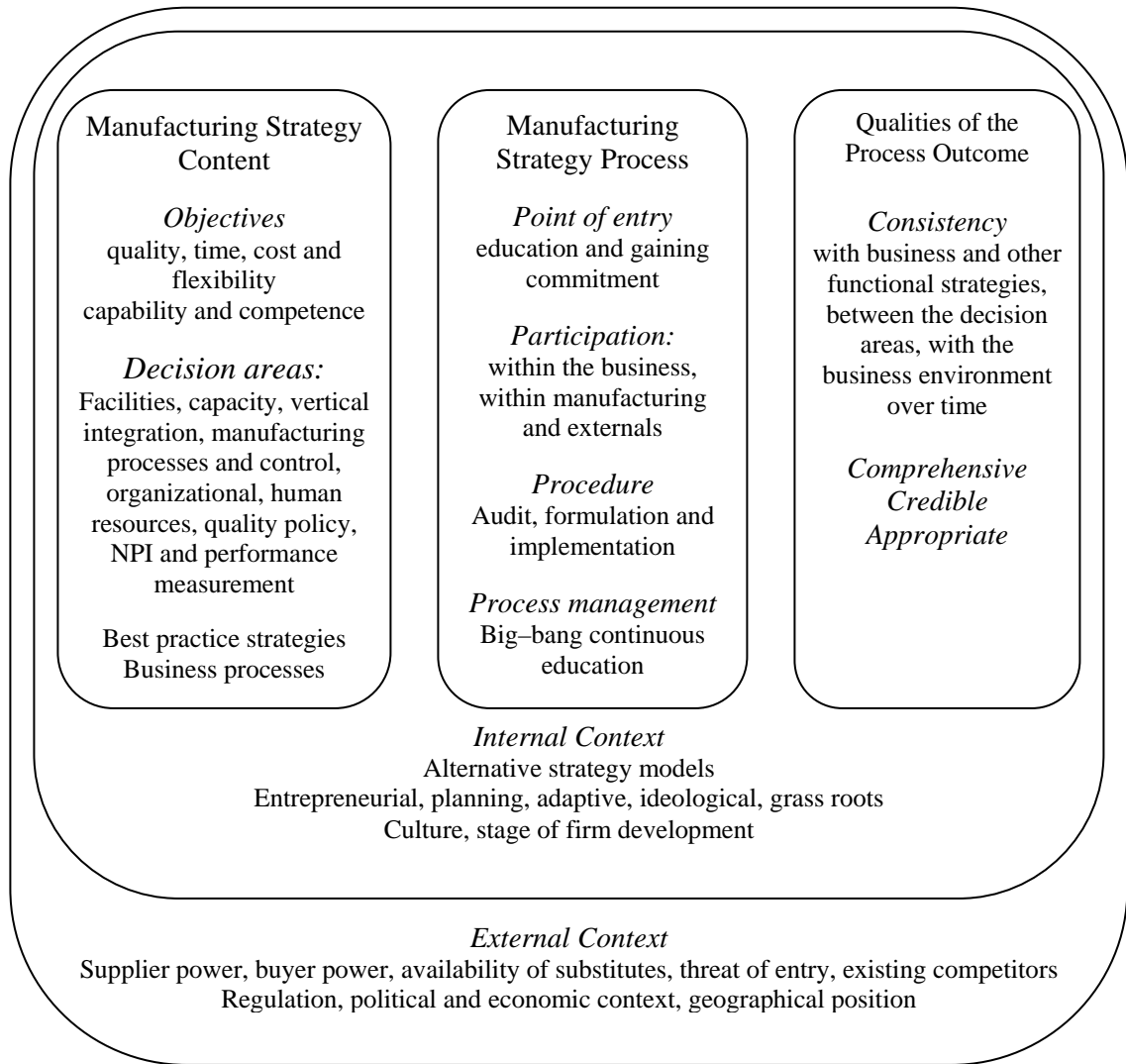
Figure A1.7: The Manufacturing Strategy Process Framework
(Mills *et al*., 1997: p. 40)

The following text appears within the figure:

Manufacturing Strategy Content

Objectives
quality, time, cost and flexibility
capability and competence

Decision areas:
Facilities, capacity, vertical integration, manufacturing processes and control, organizational, human resources, quality policy, NPI and performance measurement

Best practice strategies
Business processes

Manufacturing Strategy Process

Point of entry
education and gaining commitment

Participation:
within the business, within manufacturing and externals

Procedure
Audit, formulation and implementation

Process management
Big–bang continuous education

Qualities of the Process Outcome

Consistency
with business and other functional strategies, between the decision areas, with the business environment over time

*Comprehensive
Credible
Appropriate*

Internal Context
Alternative strategy models
Entrepreneurial, planning, adaptive, ideological, grass roots
Culture, stage of firm development

External Context
Supplier power, buyer power, availability of substitutes, threat of entry, existing competitors
Regulation, political and economic context, geographical position

Figure A1.8: Linkages between Business Strategy and the Elements of Manufacturing Strategy (Source: Schroeder *et al*., 1986: p. 413)
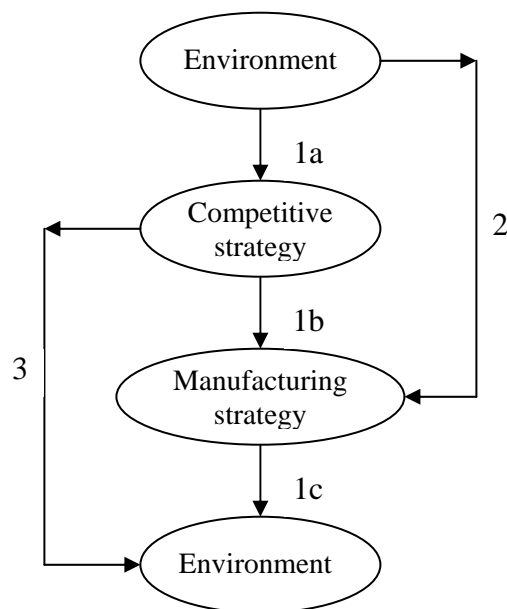
Figure A1.9: Conceptual Model of manufacturing Strategy in its Context
(Source: Ward and Duray, 1997: p. 124)

APPENDIX 2: FIELD STUDY PROTOCOL

Background

Manufacturing strategy (MS) process is a key socio–technical phenomenon within the operations management (OM) domain, whereas OM itself has been labelled as a "mongrel mix" of elements from both the natural and social sciences. Despite a growing scholarly interest witnessed in the recent past, the adoption and diffusion of MS concept within the industry have remained problematic. The explanations for this situation are many and varied. The most widely agreed upon cause has been a lack of collective understanding in how the existing MS concepts can be operationalised. Another issue that has been cited in the literature is the uncontrolled growth of manufacturing systems in the past which, in turn, has been attributed to historical reasons and/or evolutionary factors. A third reason relates to the lack of a structured approach in research, particularly, compared to other more mature disciplines.

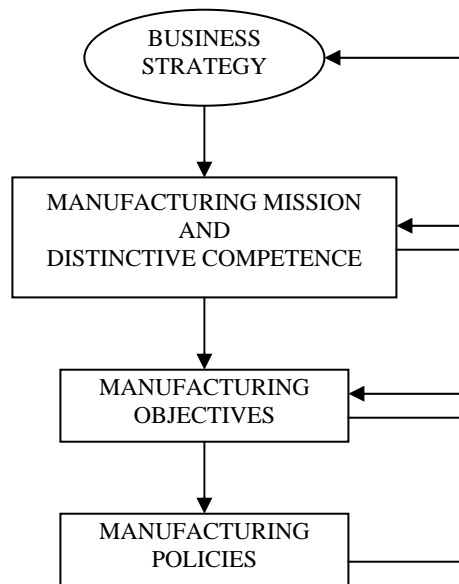Perhaps due to this limited progress, some sections of the OM community have challenged the fundamental notion of MS itself. Do manufacturing strategies exist? Do operations managers make strategically significant decisions at all? Are manufacturing decisions inherently tactical in nature? Do these factors represent the underlying cause of the slow progression and penetration of the MS concept in practice? However, there has been a growing base of anecdotal as well as empirical evidence to support the initial claims that manufacturing decisions have long–term and pervasive effects on organisational performance as well as on competitiveness at the firm level. As such, answering these questions in a single research project would be far too ambitious an effort. Nonetheless, if we can plausibly describe and explain what is actually happening in practice, for example, in terms of the patterns of manufacturing decisions and actions, the context in which they take place and their outcomes, it would certainly shed some light over some of these issues.

Terminology

Manufacturing Strategy

Manufacturing strategy is the consistent patterns in a stream of decisions and actions relating to the manufacturing structure and infrastructure of an organisation that determine the resources, capabilities and work routines of its manufacturing system in supporting a set of competitive priorities agreed upon at the business unit–level.

Competitive Priorities

Price: production and distribution of a product at a cost lower than the firm's competitors (production/inventory/capacity utilisation/productivity/logistics/warehousing)

Quality: manufacture of products with better quality or performance standards (performance/features/reliability/conformance/durability/serviceability/aesthetics)

Delivery: meet delivery schedules or promises with greater accuracy and /or offer faster delivery lead times (accuracy/dependability/availability/speed)

Flexibility: react to changes in product (customer preferences), changes in product mix, modifications to designs, fluctuations in materials and demand, changes in routing of manufacture (product/volume/process)

Service: provide better pre/after sales service (customer support/sales support/problem solving/information)

Innovation: introduce new products and process in a better and faster way than competitors (product/process)

Manufacturing/Operations Decision Areas

Structure	*Infrastructure*
Process span/vertical integration	Production planning and control
Facilities/location	Organisation
Capacity	Workforce
Technology/process	Quality systems

Manufacturing Capabilities

The capacity for a team of resources to perform some tasks or activities - typically interpreted against the dimensions of competitive priorities.

Cost: sustain profitability in price competitive markets
- cost of production/holding inventory
- capacity utilisation/labour productivity

Quality: manufacture with consistence low defect rates
provide high performance products
offer reliable products

Delivery: provide fast delivery of products
deliver products on time as promised

Flexibility: make rapid design changes
introduce new products quickly
make rapid volume changes (capacity)
make rapid changes to the existing product mix
offer broader line of products

Service: provide effective pre/post–sales service

Provide effective product support

make products easily available

customise products to market needs

Innovation: compete based on new product/process introduction
- differentiated products faster than competitors
- development of superior proprietary processes

Manufacturing Resources

Sum total of (ideally distinctive and proprietary) technologies, processes and facilities
(For example, inputs to the production process – capital equipment, skills of individual employees, patents, brand names, finance etc.)

Manufacturing Routines

Hard to imitate (unique) synergistic intra and inter–organisational work routines/practices organisational and/or communication structures, management styles etc.
(For example, relationships between people and between people and other resources)

Research Questions

How are competitive priorities/manufacturing objectives arrived at and translated into decisions and actions regarding manufacturing structure/infrastructure?

- *The basis of competition and the ways in which that basis is established/operationalised*
- *Major steps/stages in the process of establishing/operationalsing competitive priorities*
- *Causal relationships/hierarchical links and directions of information flow*

What are the consistent patterns (if any) of MS formation within specific organisational contexts and why those patterns exist that way?

- *Key elements and intermediate stages of the process of MS formation in practice*
- *How are they linked in practice?*
- *Why do these linkages/ relationships exist that way?*
- *Any inter–firm variations in terms of the influence of contextual factors*

Research Instruments

Case Sample: between six and ten companies based on theoretical sampling as follows.

– *Size of the organisation*

Large: over 500 employees and $500 million of annual revenue
Medium: between 500 – 150 employees and $500 – $100 million of annual revenue
Small: between 150 – 30 employees and $100 – $10 million of annual revenue
Micro: below 30 employees and $10 million of annual revenue

– *Maturity/stage of firm development*

to represent various stages of firm development (maturity) – embryonic/growing, consolidating, established and pioneering.

– *Manufacturing/operations systems*

to represent batch/assembly type operations processes (mid–range of the typical product–process continuum)

Interviews:
– semi–structured interviews
– depending on the size of the organisation, 3–10 management/supervisory staff representing different functional areas and hierarchical levels of the organisation, mainly from manufacturing, but also from marketing and HR where feasible.
– iterative, up to three rounds, depending on the availability of participants.
– the selection of participants and data sources (in progressive rounds of interviews) to be guided by purposive sampling based on emerging theoretical gestalts.
– recording of interviews subject to the consent from participant–otherwise note taking.

Direct Observation:
– manufacturing processes/work practices etc.
– field notes on plant tours

Archive Analysis:
– company reports/memos/operations manuals (documents) as allowed by the company
– publicly available documents/information

Ethics Requirements
– A participant consent form to be signed by both parties before interviews
– Participants are free to withhold information or withdraw from the study at any time
– Raw field data to be handling by the researcher only
– Filed data to be stored securely, in the custody of the researcher
– The identity of participants and organisations not to be disclosed in publications

Data Collection, Analysis, and Presentation of Findings
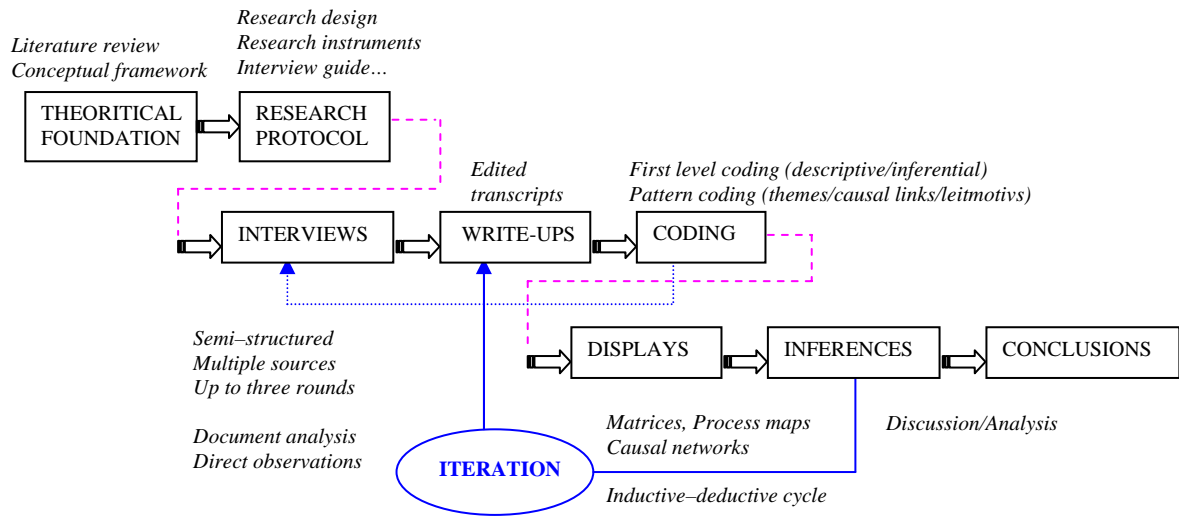
The Overall Approach to be used in the Analysis of Qualitative Data

Interview Guide:

The participant is expected to describe the decision process/mechanism (in whole or part) associated with the manufacturing function of the organisation. The overall objective is to explore how companies formulate strategies and operationalise them as represented by consistent patterns in a stream of actions. This is expected to be best captured through the narrative explanation of activities/actions/events associated with a strategic change or a major organisational developmental effort along the following lines of inquiry.

– *elements of the strategy process as perceived by the participant*

– *role-ordered aspects/people involvement (initiation, participation, response)*

– *steps of the decision process (regarding formation and/or realization of strategy)*

– *sequence or order of the above steps if any*

– *temporal dimension of the process (if possible)*

– *possible causal relationships among the elements/steps*

– *perceived formality associated with process (strategy communication, strategy documenting, planning-implementation precedence, rewarding)*

Given below is a set of sample questions that would be used during the interviews in order to stimulate discussion.

1. A brief description of the organisation structure and the participant's role (job)?

2. What is the overall strategic direction of your business (SBU)?

3. What areas your company is currently doing well in (and also doing bad)?

4. What is the current overall performance (level) of your business (SBU)?

5. What type of contribution the business expects from manufacturing? And vice-versa

6. What type of contribution the marketing/sales people expects from manufacturing? And vice-versa

7. Does manufacturing have any role/involvement/contribution in making business/sales/marketing related decisions? If yes, in what ways?

8. How does manufacturing support/contribute to achieving overall business (SBU) goals?

9. Do you have any goals or objectives (both short–term and long–term) for manufacturing? What are those objectives?

10. What would you treat as the important decision areas in manufacturing–and your own interpretation of the term "manufacturing strategy"?

11. What are the most important aspects of and the issues/concerns etc. for manufacturing

12. What is your territory of decision–making? In which areas/regarding what you normally make decisions

13. Can you narrate/describe a few initiatives of strategic nature that you have had to deal with or had involved with? Examples:

Selection/determination of the company's span of operation
Investments in new technologies and production processes etc.
Capacity additions in the long run and capacity management in the short run
Approaches to plant location/relocation
Workforce management including development of skill levels, training, improving morale/motivation, and compensation/rewards.
Design/re–design/restructuring of organisation set–ups

These decisions would be explained/described along the following lines of inquiry

[descriptors: are types or dimensions of; are caused by; are consequences of; affect or constrain; happen at these times; happen at these places/locations; precede (succeed) these; are explanations of; reasons given for; are done by/to these types of person; durations; are attitudes towards; are strategies for; are examples of concept of]

14. How do you get to know about the decisions made and the initiatives taken at the business unit level?

15. How do you communicate the decisions you make and the change initiatives undertaken at the manufacturing functional level?

16. What mechanisms are in place to generate and share/disseminate/deploy information within and across the functional boundaries of the organisation?

17. How do you measure the market performance–what are the performance indicators?

18. How do you measure manufacturing performance–what are the performance indicators?

19. Is performance measurement/management linked to strategy, and if yes, how?

20. What are the difficulties you currently face (or constraints your have to work with) in achieving manufacturing's goals/objectives?

21. The company's approach to develop capabilities to meet the long–term goals?

22. In determining strategic directions, how does the company take into account the current levels of capabilities, resources etc.?

23. General comments on managing employee morale/motivation etc.

24. What are the internal organisational factors that have affected the strategy process most? (e.g. cultural, structural, political, individual)

25. What are the external (market/environmental) factors that have affected the strategy process most? (e.g. industry factors competition related factors, broader economic factors, regulatory effects)

26. What other factors do you take into account or you think affect in your decisions and actions with regards to manufacturing?

Additional Notes on Qualitative Data Analysis:

(Sources: Miles and Huberman, 1994; Eisenhardt, 1989)

The Rationale:

To review a set of field notes, transcribed or synthesised, and to dissect them meaningfully, while keeping the relations between the parts in tact, is the ANALYIS.

This part of the analysis involves how you differentiate and combine the data you have retrieved and the reflections you make about this information.

> What is happening?
> How is it happening?
> Why is it happening?

Write–ups:

A write up is an intelligible product for anyone, not just for the field worker. It can be read, edited, for accuracy, commented on, coded and analysed. [In contrast raw field notes are sketchy and usually fairly illegible and contain private observations.] Write–up usually will add back some of the missing content because the raw field notes, when reviewed, stimulate the field worker to remember things said at that time that are not in the notes.

Coding:

Codes are tags or labels for assigning units of meaning to pieces of data (the descriptive or inferential information compiled during a study). Usually, a code is attached to chunks of varying size: words, phrases, sentences, or whole paragraphs connected or unconnected to a specific setting. The typical are a sentence or a multi–sentence chunk (assign the single most appropriate code).

They are efficient data–labelling and data–retrieval devices and empower and speed up analysis. Qualitative research heavily depends on ongoing analysis, and coding is a good device for supporting that analysis. It is a way of forcing you to understand what is still unclear, by putting names on incidents and events, trying to cluster them, communicating with others around some commonly held ideas, and trying out enveloping concepts against another wave of observations and conversations.

Coding is not just something you do to "get the data ready" for analysis, but something that drives ongoing data collection. It is a form of early (and continuing) analysis and typically leads to reshaping of the researchers perspective and of the instrumentation for the next pass. At the same time, ongoing coding uncovers real or potential sources of bias, and surfaces incomplete or equivocal data that can be clarified next time out.

Codes should relate to one another in coherent, study–important ways; they should be part of a governing structure. An operative coding scheme is not a catalogue of disjointed descriptors or a set of logically related units and sub units, but rather a conceptual web, including larger meanings and their constitutive characteristics. Clustering and display of condensed chunks then sets the stage for drawing conclusions. Codes can be at different levels of analysis ranging from a descriptive to inferential. They can take the form of a straightforward category label or a more complex one (metaphor).

– Descriptive codes: attributing a class of phenomena to a segment of text – entails little interpretation.
– Inferential codes: interpretative and include contextual relations – they need to be exhaustive, the analyst is looking for good explanatory exemplars, not for all instances.
– Pattern codes: even more inferential and explanatory – a coded segment of field notes illustrates an emergent leitmotiv or pattern that you have discerned in local events and pull together a lot of material into meaningful and parsimonious units of analysis.

Not every piece of the notes must be coded – field notes usually contain DROSS – material unrelated to the research question, either pre–specified or emerging. The field site emits a continuous stream of leads, mysteries, themes and contradictions that need to be pursued and that will never fit perfectly into a pre–coded conceptual frame or even into more grounded, emerging coding system. THE TENSION BETWEEN THESE THREE STREAMS PROJECTS THE STUDY FORWARD.

Displays:

A spatial format that presents information systematically to others. They present information in a compressed, ordered form, so that the user can draw valid conclusions and take needed action. The purpose of displays is to facilitate explanations.

In qualitative research, typical mode of display has been narrative text. The text appears in the form of written–up field notes, which the analyst scans through, extracting coded segments and drawing conclusions. Then the analysis usually goes to a second form of narrative text; the case study report.

Statistical analysis: histograms, correlation matrices, scatter plots factor plots, and vector and box–and–whisker displays.

Qualitative analysis: summarising table (matrix, chart, checklist) or figure. Data entries – short blocks of text, quotes, phrases, ratings, abbreviations, symbolic figures. Smallest unit–event, initiative, activity, action plan, action, decision, at individual, team/group, function, and SBU levels.

Qualitative data evolve, later accounts round out, qualify, put in perspective and disqualify earlier ones. All the more reason, then to generate formats near the end of data collection when they are more contextually and empirically grounded.

Interviewing, data collection and analysis (the data analysis begins at the same time data collection is started)

– iteratively collect new (and often better) data to fill in gaps
– to test new hypothesis that emerge during analysis
– corrective for built–in blind spots

Paves way for the deeper analysis such as displays.

Data collection is a selective process that one cannot and do not "get it all".

Process: sequence of events, flow, transitions, and turning points, changes over time.

Activities: regular occurring kinds of activities

Events: specific activities, especially ones occurring infrequently

Strategies: ways of accomplishing things, people's tactics, methods, techniques for meeting their needs.

Generic coding schemas

Lofland (1971)

Acts: action in a situation that is temporally brief, consuming only a few second, minutes or hours

Activities: actions in a setting of more major duration – days, weeks, months – constituting significant elements of people's involvement

Meanings: the verbal productions of participants that define and direct actions

Participation: people's holistic involvement in or adaptation to a situation or setting under study

Relationships: interrelationships among several persons considered simultaneously

Settings: the entire setting under study conceived as the unit of analysis

Biklen (1992)

Setting/Context: general information on surroundings that allows you to put the study in a larger context

Definition of the situation: how people understand, define, or perceive the setting or the topics on which the study bears

Perspectives: ways of thinking about their setting shared by informants

Ways of thinking about people and objects: understanding of each other, of outsiders, of objects in their world (more detailed than above)

Process: sequence of events, flow, transitions, turning points, changes over time

Activities: regularly occurring kind of behaviour

Events: specific activities, especially ones occurring infrequently

Strategies: ways of accomplishing things; people's tactics, methods, techniques for meeting their needs

Relationships and social structure: unofficially defined patterns such as cliques, coalitions, romances, friendships, enemies

Methods: problems, joys, dilemmas of the research process – often in relation to comments by observers.

APPENDIX 3A: START (PROVISIONAL) LIST OF CODES

Strategy Process: Inputs

IPT:	inputs
IPUT-PRI:	primary inputs
IPUT-PRI/BSTR:	business strategy
IPUT-PRI/OFCT:	other functions
IPUT-PRI/ODIR	other directives/drivers
IPUT-SEC:	secondary inputs
IPUT-SEC/PERF:	performance feedback
IPUT-SEC/INFO:	other information /data

Strategy Process Outcomes/Outputs

OCUM:	outcomes/outputs
OCUM-ITMD:	intermediate
OCUM-ITMD/CAP:	capabilities
OCUM-ITMD/RES:	resources
OCUM-ITMD/ROU:	routines
OCUM-FIN:	final
OCUM-FNL/COMP:	competence
OCUM-FNL/PERF:	performance
OCUM-FNL/FINC:	financial
OCUM-FNL/NFIN:	non-financial
OCUM-INTD:	intended/planned
OCUM-REAL:	realized/achieved

Strategy Process Attributes/Structure

ATRB:	attributes/structure
ATRB-INIT:	initiation
ATRB-INIT/TOPM:	at senior management level
ATRB-INIT/MGMT:	at other management staff level
ATRB-INIT/OPER:	at operational staff level
ATRB-INIT/PROC:	through proactive/formal planning
ATRB-INIT/REAC:	as reactive/defensive action
ATRB-INIT/EVEN:	event driven initiation
ATRB-PCPT:	participation/involvement
ATRB-PCPT/TOPM:	at senior management level
ATRB-PCPT/MGMT:	at other management staff level
ATRB-PCPT/OPER:	at operational staff level
ATRB-PCPT/OFNC	from other functions
ATRB-OBJV:	objectives/goals
ATRB-OBJV/FNCT:	functional/departmental
ATRB-OBJV/INDL:	individual
ATRB-OBJV/CORP:	corporate
ATRB-OBJV/BUSI:	business unit
ATRB-INTV:	initiatives
ATRB-INTV/FNCT:	functional
ATRB-INTV/INDL:	individual
ATRB-INTV/OTHR:	other source
ATRB-ACTN:	action plans/projects
ATRB-ACTN/FNCT:	functional/departmental
ATRB-ACTN/INDL:	individual
PROC-DEVL:	development
PROC-FORM:	formation
PROC-IMPL:	implementation/deployment
PROC-REAL:	realisation

Strategy Content/Decision Areas

CONT:	content
CONT-STRU:	structure
CONT-STRC/FACL:	facilities/location
CONT-STRC/CAPC:	capacity
CONT-STRC/TECH:	technology/process
CONT-STRC/PSPN:	process positioning
CONT-INFR:	infrastructure
CONT-INFR/PP&C:	production planning & control
CONT-INFR/WFCE:	workforce
CONT-INFR/ORGN:	organisation

Performance Management/Measurement/Control

PERF:	performance management
PERF-INDI:	performance indicators
PERF-INDI/INT:	internal
PERF-INDI/EXT:	external
PERF-REVI:	review/evaluation
PERF-REVI/INDL:	individual
PERF-REVI/FNCT:	functional/departmental
PERF-REVI/BUSI:	business unit
PERF-CNTR:	control
PERF-CNTR/INCE:	incentives
PERFCNTR/REPR:	disincentives
PERF-AUDT:	audit/assessment

Information Sharing/Dissemination/Communication

INFO:	information
INFO-GEN:	generated
INFO-GEN/INT:	internally
INFO-GEN/EXT:	externally
INFO-DIS:	disseminated
INFO-DIS/DOWN:	top-down
INFO-DIS/UP:	bottom-up/feed back
INFO-SHAR:	shared at same level
INFO-AGGR:	aggregated bottom up
INFO-FILT:	filtered
INFO-FILT/DOWN:	top-down
INFO-FILT/UP:	bottom-up

Context variables

CTXT:	context variables
CTXT-INT:	internal
CTXT-INT/ORG:	organizational type, size
CTXT-INT/CULT:	culture and discipline
CTXT-INT/PROD:	product type
CTXT-INT/POLT:	internal political
CTXT-INT/INDL:	individual
CTXT-EXT:	external
CTXT-EXT/IND:	industry factors
CTXT-EXT/REG:	regulatory aspects
CTXT-EXT/PEC:	political/economical
CTXT-EXT/ENV:	environmental aspects

APPENDIX 3B: FINAL LIST OF CODES

1	Strategic Planning Process\Overall Strategic Direction\Quality Goals
2	Strategic Planning Process\Overall Strategic Direction\Customer Service Goals
3	Strategic Planning Process\Overall Strategic Direction
4	Strategic Planning Process\Market Forces
5	Strategic Planning Process\Annual Profit Plan
6	Strategic Planning Process
7	Performance Management\Performance Objectives\Individual Objectives\Supervisory and Technical Staff
8	Performance Management\Performance Objectives\Individual Objectives\Manufacturing Manager
9	Performance Management\Performance Objectives\Individual Objectives
10	Performance Management\Performance Objectives\Functional Objectives
11	Performance Management\Performance Objectives
12	Performance Management\Performance Measures
13	Performance Management\Performance Feedback
14	Performance Management\Market Intelligence
15	Performance Management
16	Outcomes of MS Process\Market–based
17	Outcomes of MS Process\Capability–based
18	Outcomes of MS Process
19	MS Process Attributes\Temporal Aspects\Time Frame
20	MS Process Attributes\Temporal Aspects\Sequence
21	MS Process Attributes\Temporal Aspects
22	MS Process Attributes\Strategy Initiation\Opportunistic
23	MS Process Attributes\Strategy Initiation\Forced
24	MS Process Attributes\Strategy Initiation\Evolutionary
25	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Technology Driven
26	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Regulatory Requirement
27	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Personal Aspirations
28	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Operational Problems

29	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Improvement Need
30	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Growth-based
31	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Event-triggered
32	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Entrepreneurial
33	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Directives form Top
34	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)\Competitive Pressure
35	MS Process Attributes\Strategy Initiation\Cause-specific (Motives)
36	MS Process Attributes\Strategy Initiation\Actor-specific\Supervisory Staff
37	MS Process Attributes\Strategy Initiation\Actor-specific\Other Management Staff
38	MS Process Attributes\Strategy Initiation\Actor-specific\Operations Manager
39	MS Process Attributes\Strategy Initiation\Actor-specific\Marketing Manager
40	MS Process Attributes\Strategy Initiation\Actor-specific\General Manager
41	MS Process Attributes\Strategy Initiation\Actor-specific\External Actors
42	MS Process Attributes\Strategy Initiation\Actor-specific
43	MS Process Attributes\Strategy Initiation
44	MS Process Attributes\Realisation of Initiatives\Implementation\Project-manage
45	MS Process Attributes\Realisation of Initiatives\Implementation\Outsource
46	MS Process Attributes\Realisation of Initiatives\Implementation
47	MS Process Attributes\Realisation of Initiatives\Execution
48	MS Process Attributes\Realisation of Initiatives\Actioning
49	MS Process Attributes\Realisation of Initiatives
50	MS Process Attributes\Progression of Initiatives\Formulation\Evaluate
51	MS Process Attributes\Progression of Initiatives\Formulation\Commit
52	MS Process Attributes\Progression of Initiatives\Formulation\Analyse
53	MS Process Attributes\Progression of Initiatives\Formulation
54	MS Process Attributes\Progression of Initiatives\Dormant
55	MS Process Attributes\Progression of Initiatives\Consolidation\Reject-Return
56	MS Process Attributes\Progression of Initiatives\Consolidation\Peer-review
57	MS Process Attributes\Progression of Initiatives\Consolidation\Negotiated
58	MS Process Attributes\Progression of Initiatives\Consolidation\Hold

59	MS Process Attributes\Progression of Initiatives\Consolidation\Evaluate
60	MS Process Attributes\Progression of Initiatives\Consolidation\Enforced
61	MS Process Attributes\Progression of Initiatives\Consolidation\Discuss-Debate
62	MS Process Attributes\Progression of Initiatives\Consolidation\Consensus Building
63	MS Process Attributes\Progression of Initiatives\Consolidation\Cold-canvassing
64	MS Process Attributes\Progression of Initiatives\Consolidation\Assess
65	MS Process Attributes\Progression of Initiatives\Consolidation\Appraisal
67	MS Process Attributes\Progression of Initiatives\Consolidation
68	MS Process Attributes\Progression of Initiatives\Commitment\Authorisation
69	MS Process Attributes\Progression of Initiatives\Commitment\Affirmation
70	MS Process Attributes\Progression of Initiatives\Commitment
71	MS Process Attributes\Progression of Initiatives\Active
72	MS Process Attributes\Progression of Initiatives
73	MS Process Attributes\Participation in MS Process\Role-specific\Ruling
74	MS Process Attributes\Participation in MS Process\Role-specific\Reviewing
75	MS Process Attributes\Participation in MS Process\Role-specific\Resistance
76	MS Process Attributes\Participation in MS Process\Role-specific\Implementation
77	MS Process Attributes\Participation in MS Process\Role-specific\Facilitation
78	MS Process Attributes\Participation in MS Process\Role-specific\Execution
79	MS Process Attributes\Participation in MS Process\Role-specific\Authorisation
80	MS Process Attributes\Participation in MS Process\Role-specific\Actioning
81	MS Process Attributes\Participation in MS Process\Role-specific
82	MS Process Attributes\Participation in MS Process\Actor-specific\Supervisory Staff
83	MS Process Attributes\Participation in MS Process\Actor-specific\Sales & Marketing Mgmt
84	MS Process Attributes\Participation in MS Process\Actor-specific\Other Staff
85	MS Process Attributes\Participation in MS Process\Actor-specific\Other Management
86	MS Process Attributes\Participation in MS Process\Actor-specific\Manufacturing Manager
87	MS Process Attributes\Participation in MS Process\Actor-specific\General Manager
88	MS Process Attributes\Participation in MS Process\Actor-specific\External Party
89	MS Process Attributes\Participation in MS Process\Actor-specific\Board of Directors

90	MS Process Attributes\Participation in MS Process\Actor-specific
91	MS Process Attributes\Participation in MS Process
92	MS Process Attributes\Elements of MS Process\Strategic Initiatives
93	MS Process Attributes\Elements of MS Process\Strategic Events
94	MS Process Attributes\Elements of MS Process\Strategic Decisions
95	MS Process Attributes\Elements of MS Process\Strategic Actions
96	MS Process Attributes\Elements of MS Process\Action Plans
97	MS Process Attributes\Elements of MS Process
98	MS Process Attributes
99	MS Content\Manufacturing Objectives
100	MS Content\Decision Areas\Workforce
101	MS Content\Decision Areas\Vertical Integration
102	MS Content\Decision Areas\Process-Technology
103	MS Content\Decision Areas\PPC
104	MS Content\Decision Areas\Organisation
105	MS Content\Decision Areas\Location
106	MS Content\Decision Areas\Capacity
107	MS Content\Decision Areas
108	MS Content
109	Inputs to MS Process\Strategic Directions
110	Inputs to MS Process\Profit Drivers
111	Inputs to MS Process\Performance Feedback
112	Inputs to MS Process\Parent Co Directives
113	Inputs to MS Process\Other Drivers
114	Inputs to MS Process\Marketing's Goals
115	Inputs to MS Process\Competitive Priorities
116	Inputs to MS Process
117	Contextual Factors\Internal Contextual Factors\Product-Market
118	Contextual Factors\Internal Contextual Factors\Political\Union Influence
119	Contextual Factors\Internal Contextual Factors\Political\Position Power

120	Contextual Factors\Internal Contextual Factors\Political\Coalition Formation
121	Contextual Factors\Internal Contextual Factors\Political
122	Contextual Factors\Internal Contextual Factors\Organisational\Structure
123	Contextual Factors\Internal Contextual Factors\Organisational\Size
124	Contextual Factors\Internal Contextual Factors\Organisational\Ownership
125	Contextual Factors\Internal Contextual Factors\Organisational\Maturity
126	Contextual Factors\Internal Contextual Factors\Organisational\Culture
127	Contextual Factors\Internal Contextual Factors\Organisational
128	Contextual Factors\Internal Contextual Factors\Management Style
129	Contextual Factors\Internal Contextual Factors\Individual
130	Contextual Factors\Internal Contextual Factors
131	Contextual Factors\External Contextual Factors\Regulatory
132	Contextual Factors\External Contextual Factors\Market Conditions
133	Contextual Factors\External Contextual Factors\Economic
134	Contextual Factors\External Contextual Factors\Competition
135	Contextual Factors\External Contextual Factors
136	Contextual Factors
137	Basis of Competition\Sales & Marketing
138	Basis of Competition\Quality
139	Basis of Competition\Price
140	Basis of Competition\Management Style
141	Basis of Competition\Innovation
142	Basis of Competition\Flexibility
143	Basis of Competition\Delivery
144	Basis of Competition\Customer Service
145	Basis of Competition