KEY SUCCESS FACTORS OF A TELECOMMUNICATIONS SOLUTION PROVIDER'S NEW PRODUCT DEVELOPMENT STRATEGY

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Abstract

An understanding of the key success factors of New Product Development Strategy remains obscure for many organisations in the dynamic telecommunications industry. As managers recognise the heightened importance of innovation to competitive success, they face an apparent paradox: the orderly and predictable decisions on which a business rests depend increasingly on the disorderly and unpredictable process of new product development.

The objectives of this study were to evaluate the key success factors of a telecommunications solution provider's new product development strategy and to explore the relationship between these key factors. The company was studied from two levels. The strategic level focussed on the corporate strategy, the role of management, organisational structure and organisational culture; while the project level concentrated on the NPD process, the staff involved and the information needed for NPD success. The relationship between the two levels was also investigated in relation to the company's NPD strategy.

The results of this study showed that there is a very close relationship between the factors and that problems with one factor affect another. Whilst much research has been conducted in each of these areas independently, very few researchers in the field integrate all the different factors. The findings revealed that the company under investigation had more problems at the strategic level than at the project level. The strategic issues were found to be the basis of problems identified at the project level.

Declaration

I declare that this research report is my own, unaided work. It is submitted in partial fulfilment of the requirements for the degree of Masters of Business Administration in the University of Natal, Durban. It has not been submitted before for any degree or examination in any other university.

Theenasagree Gengan

30 June 2002

Dedication

To my mum and dad Mr. and Mrs. K Gengan, your wings of love, support and encouragement has carried me through this MBA. Also to Mr. M Krishinchand, your devotion and faith in me has given me the power to believe in myself.

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CHAPTER 1 INTRODUCTION

1.1 Research Problem

Given today's intense competition, companies that fail to develop new products are putting themselves at great risk. Their existing products are vulnerable to changing consumer needs and tastes, new technologies, shortened product life cycles and increased domestic and foreign competition. (Kotler, 1997:308) So, it is essential for a firm to keep developing new products, as well as modifying its current products, to meet changing customer needs and competitors' actions. Not having an active New Product Development (NPD) process means that consciously, or subconsciously, the firm has decided to milk its current products and go out of business. New Product Development is not an optional matter. "It has to be done just to survive in today's dynamic markets"(Perreault & McCarthy, 2002:288).

A commitment to continuous innovation through new product development is the source of sustainable competitive advantage. (Baker and Hart, 1999:12) As Lord Weinstock, MD of the General Electric Company Ltd stated in the report on Innovation in the Manufacturing Industry (1995), "Innovation is indispensable in maintaining a successful business... If you do not change as the times, the markets and products required, you are dead." (Baker and Hart, 1999:17)

At the same time, new product development is risky. New products continue to fail at a disturbing rate. (Kotler, 1997:308) "The failure of new products to stand up to the competitor pressures or consumer demands exerts a force on the organisation such

that the firm faces increasing survival pressures rather than demands for growth" (Nolan, 1999:1).

1.2 The Need for the Research

Given the challenges, it is essential for a company to ensure the success of their new products. (Kotler, 1997:309) Product innovation is a potential strategic weapon for all businesses. Skilful product innovation is an urgent management task in markets experiencing rapid technological change such as the telecommunications market. CMG-Wireless, the company chosen for evaluation in this study, is an active participant in this dynamic market. There is a need for CMG's managers to learn more about the intricacies of product development. There is a growing need by telecommunications solution providers, which now need to make more frequent changes to their products, for information on how the required tasks can be managed efficiently. The study of strategic management of successful new product development has not been conducted on CMG before, therefore, in regards to the company, there is a need for this research. It will benefit the company by providing a deeper understanding of the internal factors important for successful new product development.

For academic reasons, too, there is a need for more research. Most academic writings in the area have concentrated on specific sub-activities within the span of product development tasks. There have been studies into new product idea generation techniques; into screening procedures and practices; into project management

techniques; and into the different ways in which newly developed products might be launched. But only a number of academic researchers have considered all the elements involved in an integrated way. The notable exceptions are Booz, Allen and Hamilton (1982); Cooper (1984); Crawford (1991); Baker & Hart (1999); and Johne & Snelson (1988). Again, no study has been conducted on CMG's new product development strategy, specifically, its internal organisational factors in an integrated manner.

1.3 Research Objectives

The research objective of this study is to evaluate the key success factors of CMG's New Product Development (NPD) Strategy. This research objective will be achieved by way of a detailed investigation into the seven key organisational factors identified as being crucial for New Product Development success. The main research objective will therefore be broken up into the following sub-objectives:

1.3.1 To evaluate CMG's strategic management factors of NPD :

- To investigate CMG's corporate strategy in relation to NPD
- To investigate CMG's management style in relation to NPD
- To investigate CMG's organisational culture in relation to NPD
- To investigate CMG's organisational structure in relation to NPD

1.3.2 To evaluate CMG's project-related factors:

- To investigate CMG's NPD process
- To investigate CMG's staff involved in the NPD process
- To investigate CMG's information systems in relation to NPD

1.3.3 To explore the relationship between the above seven key success factors at CMG.

1.3.4 To explore the relationship between CMG's strategic management and project management.

1.4 Subsequent Chapters of the Report

Chapter Two: Literature Review

The literature pertaining to the key success factors around new product development will be reviewed in this chapter. The review will explore the new product concept as seen by key researchers in this field and lead to a discussion of new product categories as well as the need for new product development strategy. Then the key success factors will be examined, including both the strategic-level issues and the project-related issues. The review will conclude with a suggested model for successful new product development derived from the literature itself.

Chapter Three: The Case Study: CMG-Wireless Data Solutions

This Chapter focuses on the company under investigation, including the background and structure of the company. The company's product is introduced and categorised according to its newness to the company and the marketplace, as the literature suggested. The product positioning will also be discussed and eventually the telecommunications market will be reviewed.

Chapter Four: Research Methodology

This chapter outlines the research type, the method of data collection, sampling procedures, the pilot study, the main study and the questionnaire design. It concludes with a description of the data analysis techniques and limitations to the study.

Chapter Five: Results

This chapter will include the results displayed in relation to the research objectives stated in Chapter One. Graphs and Pie Charts derived from frequency tables will be used to present the results.

Chapter Six: Interpretation

This chapter is an interpretation of the results of Chapter Five. Here again, the analysis will be related to the research objectives. Focus is applied to the meaning of the results as they relate to the literature.

Chapter Seven: Recommendations

This chapter will give recommendations on how to solve the problems identified from the results. The implications of these problems for CMG's management will also be explained. This chapter is linked to the chapter on the interpretation of the results. Suggestions will be made regarding the seven key success factors that were explored in the study.

Chapter Eight: Conclusion

This chapter will summarise the research problem and the findings of the study. The overall implication for management is expressed and the chapter concludes with some suggestions for further research.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

Innovation isn't just about new products. Innovation is really about change. And the ability to change is now a critical attribute in the business environment. It is essential to survival in these ever more turbulent times. In everything a company does, in every facet of its business, in its products and in its processes, it will have to innovate. Even successful companies will need to innovate. Remember the adage "Success breeds failure"? To fail to change is to remain static and to be left behind. (Ball & Asbury, 1989:96)

Product development and innovation have always been major facets of competitive rivalry, but the present dynamic quality of the economy is particularly characterised by an expanding frontier of new products, acquisitions and mergers. (Baker & Hart, 1999:30)

Michael Porter asserts that prosperity is created, not inherited, and depends upon the capacity of a country's industry to innovate and upgrade. Porter goes on to say that: "Firms create competitive advantage by perceiving or discovering new and better ways to compete in an industry and bringing them to market, which is ultimately an act of innovation. Innovation is here defined broadly, to include both improvements in technology and better methods of doing things. It can be manifested in product changes, process changes, new approaches to marketing, new forms of distribution and new concepts of scope" (Baker & Hart, 1999:12).

What Porter, essentially an economist, terms innovation is what business people, and especially marketers refer to as new product development (NPD), which contribute to the major theme of this research project. (Baker & Hart, 1999:12) Since this research focuses on the marketing field, new product development will therefore be referred to as NPD, which is the accepted abbreviation for the term.

While the prevailing preference is to avoid or resist change - because change implies risk and uncertainty of having to learn new ways and modify old habits - in the real world one can only improve one's position by encouraging and accepting change. For producers this means that they must continuously develop new products and processes because otherwise any competitive advantage they possess will be eroded by other organisations, which seek new and improved ways of satisfying the customers needs. (Baker & Hart, 1999:12-13)

2.2 New Product Development Concept

"New Product Development" is defined by the Oxford Dictionary for the Business World (1993), as "a marketing procedure in which new ideas are developed into viable new products or extensions to existing product ranges. New ideas, which are generated either internally (e.g. by scientific research) or by feedback from consumers are first screened for prima facie viability; the few that remain are further reduced by concept tests and detailed analysis of their potential profitability. Any ideas that survive these obstacles are subjected to extensive product development. Prototypes are made and tested within the company and among consumers, and

improvements made. This cycle is repeated until satisfactory marketing research results are obtained, when the new product will be launched, possibly first in a restricted area". (The Oxford Dictionary, 1993:564-565)

This research project uses the term "new product development" to cover the process by which new products are developed in companies. However, NPD is not the only term used to describe this process. In fact, the particular terminology employed depends very much on the domain in which it is used. 'NPD' tends to be the label used by those in marketing and management. (Cooper, 1979); those in the R & D domain invariably refer to 'innovation' (Rothwell 1977); those from the sphere of engineering use the term 'design'; and those from a 'design' background - in the widest sense of the word - may prefer to see 'new product design' as a specific stage in the process of developing new products. However, this categorisation is not always clear cut, and writers from marketing and management also use the term 'design' and 'innovation' (Johne & Snelson, 1988). In this dissertation the terms new product development and product innovation will be used interchangeably, reflecting the interdisciplinary nature of NPD.

Every company must carry on new product development. Replacement products must be created to maintain or build sales. Furthermore, customers want new products and competitors will do their best to supply them. A company can add new products through new product development. The new product development route can take two forms. The company can develop new products in its own laboratories. Or

it can contract with independent researchers or new product development firms to develop specific products for the company. (Kotler, 1997:11)

2.3 New Product Categories

The consulting firm Booz, Allen and Hamilton (1982) has identified six categories of new products in terms of their newness to the company and to the marketplace:

- **New-To-The-World-Products**: New products that create an entirely new market.
- **New Product Lines**: New products that allow a company to enter an established market for the first time.
- **Additions to Existing Product Lines:** New products that supplement a company's established product lines
- **Improvements and Revisions of Existing Products:** New products that provide improved performance or greater perceived value and replace existing products.
- **Repositioning:** Existing products that are targeted to new markets or market segments.
- **Cost Reductions**: New products that provide similar performance at lower cost.

Kotler states that only 10% of all new products are truly innovative and new to the world. These products involve the greatest cost and risk because they are new to both the company and the marketplace. Thus, most company new product activity is devoted to improving existing products. (Kotler, 1997:307)

Seres (1978) on the other hand, identifies three types of new products:

- **Improved products**: Products that are developments of existing products representing a meaningful alteration, similar to the above category - improvements and revisions of existing products
- **Imitative products**: Products which have already been introduced to the market by others, but are new to a particular firm, similar to the second category above - New Product Lines
- **Innovative Products**: Products that are truly new to the market , similar to the first category above, New-To-The-World-Products (1987:11)

2.4 The Need For New Product Development Strategy

One of the major sets of factors influencing the success of new products is the strategic issue. These issues encompass the direction and objectives set for new product development, which should reinforce the overall competitive strategy of a firm. Unless firms respond to the changing business environment by constant development of their product mix, the inevitability of the product lifecycle means they will die. Therefore, at the heart of corporate strategy is the continual development of products. (Baker & Hart, 1999:190). The benefits of articulating new product strategy detailed by Booz. Allen and Hamilton (1982) can be shown to have direct links to several of the success factors for NPD.

The pace at which technical change takes place within an industry plays a large part in determining the need for new products. Companies are increasingly dependent on new and improved products to maintain their competitive position. The amount of money spent on research and development is a further indication of how important product development is.

In 1980/81 the Siemens Group, one of the world's leading companies in the electrical and electronics field, spent over 3 billion Deutschmark (nine per cent of its total sales) on research and development. The reward for this huge expenditure in this area can be appreciated when it is realised that 49% of the Siemens total annual turnover came from the sales of products it had launched in the last five years. (BMI-TechKnowledge, 2001)

Notwithstanding all the money put to research and development, many new products still fail once they are placed on the market. Kotler refers to this dilemma as the product development dilemma. (Blem, Reekie & Brits, 1992:237)

2.5 Factors Affecting Success of New Product Development

Understanding the interrelationship between personnel policy, company infrastructure, market and manufacturing expertise is crucial to the management of effective change. Without appropriate resources in all these areas no organisation can effectively be innovative, whatever the attractiveness of the market, the level of government support, financial resources and market position.

The key areas of internal corporate resources identified by West, A (1981) for successful innovation together with the major themes identified by Baker & Hart (1999) as being crucial in the NPD process will be integrated with theories of other important authors such as Cooper (1979), Ball & Asbury (1989), Johne & Snelson (1988), and Crawford (1991). International studies and researches around the field of NPD strategy will also be reviewed. The key success factors of NPD identified by the above also overlaps with McKinsey's 7Ss Framework.

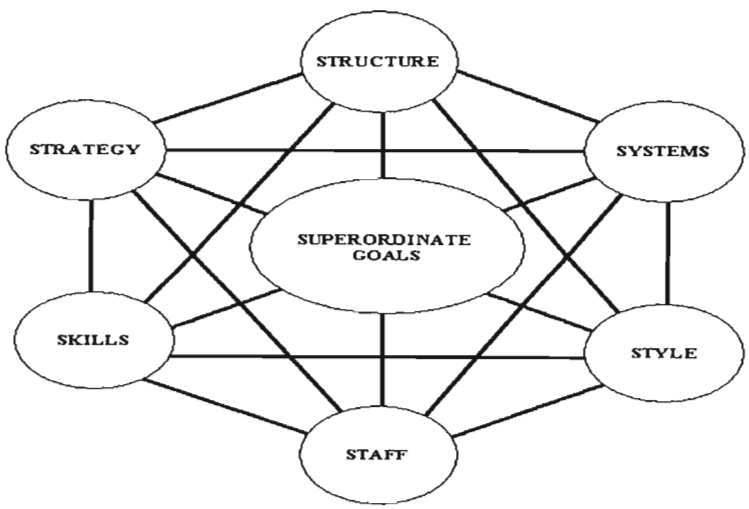


Figure 2.1: McKinsey's 7Ss Framework

Source: Lynch,1997:779

This chapter of the research project does not attempt an exhaustive review of NPD literature. Indeed, attempting such a feat across the salient disciplines would be an onerous task. Rather, it focuses on the themes that research has shown to have an impact on the success rates of NPD, namely, corporate strategy, organisational structure, organisational culture, the role of management, the NPD process itself, the people responsible for its implementation and how information contributes to the process. Following these central themes, a model for successful NPD is proposed. This model shall be used as the basis for the questionnaire development. (See Chapter 4)

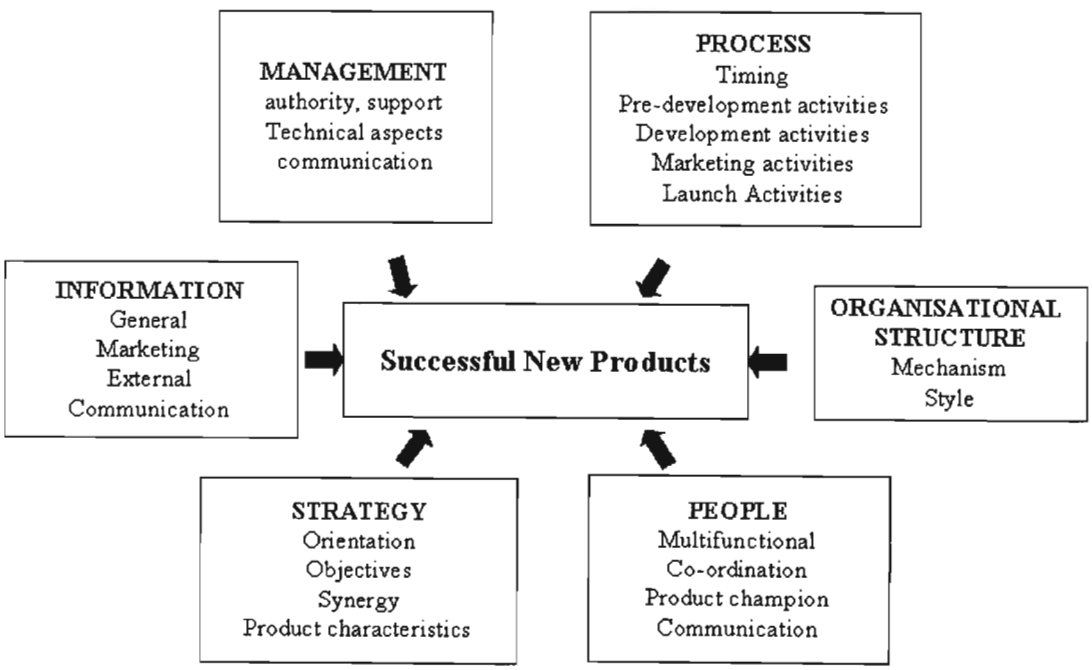


Figure 2.2: Key Success Factors of New Product Development
Source: Baker & Hart, 1999:163

These themes are detected at two different organisational levels: (1) relating to the specific NPD project, i.e. the way in which individual products are developed, and (2) relating to the way in which the innovating company approaches the development of new products in general. The latter are called 'strategic' and the former 'project' level issues. The 'strategic' issues operate at the organisational level. They are not particular to one project, but instead exert an influence over every project.

2.6 Strategic Issues

2.6.1 Corporate Strategy

The strategy of a company dictates how it will operate internally, and how it will approach the outside world. To be successful, NPD must be guided by, that is derived from, the corporate goals of the company, and therefore there is a need to set clearly defined objectives for new product development projects. A new product strategy ensures that product innovations become a central facet of corporate strategies. (Cooper & Kleinschmidt, 1994:381), that objectives are set and that the right areas of business are developed. (Cooper & Kleinschmidt, 1987) Thus, a critical success factor for NPD is the extent to which a specific strategy is set for guiding NPD efforts. While it is often argued that new product development should be guided by a new product strategy, it is important that that strategy is not so prescriptive as to restrict, or stifle, the creativity necessary for NPD. Getting the balance right is not straightforward. (Baker & Hart.1999: 163)

A strategy for technology and for products give development effort guidance and direction. But to ensure consistency and coherence across these strategies and to link them explicitly to business as well as development objectives, a firm must define its basic development goals and objectives. At the aggregate level, the goals and objectives need to be made explicit and then juxtapositioned to examine their compatibility and complementarity. The purpose of this process is to provide integration both in the aggregate and at the level of the individual project. When effectively tied together, these goals provide an organisation with confidence that their strategies will generate the business performance desired. (Wheelwright & Clark, 1992:44-45) The strategic focus during development has classified priorities for new products being developed. "The way in which the strategic focus is formed can be seen as a function of technology and marketing inputs, synergy and risk acceptance"(Baker & Hart, 1999:164).

The emphasis on a balance between the technology and the marketing orientations in the strategy literature reflects an overall trend away from arguing the benefits of one orientation above the other, towards an acceptance that there should be a fusion between technology-led and market-led innovations at the strategic level. (Johne & Snelson, 1988: 115) The relationship between the NPD and existing activities, known as the synergy with existing activities, is also widely considered in the literature on NPD. High levels of synergy are typically less risky, because a company will have more experience and expertise. (Johne & Snelson, 1988: 115)

The creation of an internal orientation (culture) or climate, which accepts risk, is highlighted as a major role for the new product strategy. Although synergy might help avoid risk associated with lack of knowledge, the pursuit of product advantage must entail acceptance that some projects will fail. "An atmosphere that refuses to recognise this tends to stifle activity and the willingness to pursue something new" (Baker & Hart, 1999:164).

The profile that emerges of the Financial Mail top performing companies states that product development is the most favoured method of achieving corporate growth. Market development runs a close second. (Financial Mail.1995: 36) Product innovation is seen as a key to survival. However, the focus in the majority of organisations is on the redevelopment of old products. Consequently there is a lack of truly innovative product development programmes in the top companies with only 10-15% of current top ten products developed in the past five years. The most common strategic role assigned to new products is to defend existing market positions. (Financial Mail.1995: 36)

In a study conducted by Davies (1997), on key characteristics of leading South African innovators, it was identified that aggressive strategies are utilised, favouring market penetration and market development during NPD. The study also confirms what was mentioned above about goals and objectives of NPD projects. Top management, using a group approach, determines explicit plans for development work and sets broad objectives for organic growth (Davies, 1997:133). Crawford

(1991) in his book New Products Management says that the best strategy for any situation is one that maximises company goals.

2.6.2 The Role of Management

Some research attention has focused on the role of top management in the eventual success of NPD. While Maidique & Zirger (1984) found new product successes to be characterised by a high level of top management support, Cooper & Kleinschmidt (1987) found less proof of top management support.

West (1992: 142-143), however, states that management styles that are essentially based on non-involvement will be poor resources for innovation management of any type. Senior management in particular will need to be involved and committed at all stages of the process, as the majority of innovation studies reveal this as being crucial in creating the right climate for change. The above is confirmed by Davies (1997:133), in her study on new product development who found that "where top management is involved in most issues, there is a higher likelihood of success." Some of the leaders of the super-performers which are the most participative in style are the most adept at driving and inspiring their organisations to innovate (Ball & Asbury,1989:187).

Davies' (1997:134) research goes on to suggest that leadership of successful companies have a 'hands-on' approach, they get involved in most issues, are primarily responsible for setting explicit budgets and plans for NPD and use a group approach

for formulating corporate strategy. They reflect a bold attitude to risk and an aggressive approach to product innovation. They draw on ideas from all levels in the company and delegate responsibility to departmental executive level.

"Management styles, both organisational and individual, must be appropriate to the type of policy that the company is following" (West, 1992:142). The management style in place should obviously approximate to the demands of the innovation process, and if there is a serious mismatch, the likelihood of a firm being able to carry through a particular NPD project is seriously reduced.

Management is responsible for setting the level and tone of communication in the organisation. As with all processes management should drive communication. Amongst the super-performers it is found that management spends an inordinate amount of time communicating. It goes without saying that communication of information should be two-way. Hence, the leader needs to listen to keep in touch. "Leaders of super-performing companies take the time to tell people their efforts were noted and appreciated. This in turn motivates staff and aids product innovation" (Ball &Asbury, 1989:197-98).

With the speed of innovation steadily increasing throughout the world, lengthy clearance procedures and increase in the number of managers often mean that the firm is unable to respond quickly as better-organised competitors. (West, 1992:121)

Therefore, a multi-layered management structure tends to disadvantage the company from a competitive point of view.

Hart & Service (1988) report on the attitudes and opinions of company managers to product design, and identify the managerial orientations, which are most consistent with successful performance. A 'balanced' managerial orientation that combines technical commitment with marketing inputs is found to be most closely associated with superior competitive performance.

According to Baker & Hart (1999), one of the most important roles which top management has to fill is that of climate setting by signalling the nature of the corporate culture to the rest of the organisation. In some cases, it is necessary for the firm to change its philosophy on NPD, in turn causing a change in the whole culture. "The leaders of super-performing companies must be people that define the culture and who act as custodians of that culture (Ball & Asbury, 1989:197). Company executives will have to encourage a culture of innovation and entrepreneurship to be successful. (West, 1992:141)

2.6.3 Organisational Culture

In general an entrepreneurial culture is most effective in achieving successful NPD. According to Peter Senge, a management expert at MIT, some of the factors that must be present in the culture to encourage NPD are as follows (Baker & Hart.1999: 165):

- Experimentation must be encouraged

- Specialists should be made generalists
- Hierarchies must be broken down
- Freeflow of information should be encouraged between employees
- More time should be consciously dedicated to thinking

The pervasiveness of shared values or common goals within a particular company is of crucial importance in coping effectively with the change associated with new product development.(West, 1992:143) Change introduces enormous strains into organisations, and however good the communication systems are within the enterprise, they substantially reduce efficiency unless the staff are aware of, and share a common perception about, the task involved and the individual sacrifices or commitment necessary to achieve it. Positive internal attitude is identified as one of the main necessary internal building blocks to achieve rapid and successful change, and often the most important. High levels of shared values are often considered one of the main reasons why large Japanese industrial companies are able to innovate so quickly and adapt to changes so smoothly.

Some of the shared values in Japanese companies are:

- Work designed around co-operative teamwork
- Generalist orientation
- Harmony and stability emphasised
- Considerable job mobility

- Worker involved as equal; kept informed of prices, targets, competition
- Suggestions welcomed. Training to improve quality of suggestions, high implementation rate
- Work smarter, not harder philosophy (West,1992:143-44).

All these strategies concentrate on process rather than product. If organisations are set up to create rather than react, new products should follow. Closely aligned to the notion of climate creation is the responsibility which top management has for the overall organisational structure, which is a research theme in its own right.

2.6.4 Organisational structure

The overall or strategic structures of an organisation are of concern, rather than the specific team structures that might be put in place for a given program of new product development. In fact, this is a huge area of management research, with inputs from Bentley (1990), Rothwell & Whiston (1990), Lynch (1997) and Mintzberg & Quinn (1991).

Bentley (1990) presents the findings of an empirical study which is based on the hypothesis that the structure and style which a company adopts is closely related to its ability to connect with its market and, since proximity to the market is a determinant of new product success, the organisational structure and style is an important issue. Bentley advocates a flexible structure and style which supports the ability of

individuals to behave innovatively thus echoing, in terms of organisation structure, the issues raised by the section on strategic orientation.

Similarly, in considering organisational styles for successful product innovation, Rothwell & Whiston (1990) lean toward flexibility, the advocating an organic style of organisation which:

- Is free from rigid rules
- Is participative and informal
- Has many views aired and considered
- Has face-to-face communication: little "red tape"
- Has interdisciplinary teams: breaking down departmental barriers
- Puts emphasis on creative interaction & aims
- Is outward looking: willing to take on new ideas
- Has flexibility with respect to changing needs, threats and opportunities
- Is non-hierarchical
- Has information flowing downwards as well as upwards

Lynch (1997:715) agrees that innovation is flexible and open-ended. The process needs to be freewheeling and experimental. However, in contrast to what Cooper & Kleinschmidt (1987) mention about NPD strategy, Lynch (1997) claims that innovation is possibly without a clearly defined or fixed objective.

Mintzberg's (1991:341) comments on the innovative process, supplementing the above theories, had complex innovation particularly in mind when outlining three guidelines for organising project teams, which are summarised as:

- Flexible structures that allow experts not just to exercise their skills but to break through conventional boundaries into new areas.
- Co-ordination within the team needs to be undertaken by experts with a technical background in the area, rather than a superior with authority from outside.
- Power in the team needs to be distributed among the experts, where appropriate. Much of the activity will consist of liaison and discussion among the experts as they proceed with their innovative ideas.

Having looked at the above strategic influences of success in NPD, the focus will now turn to those influences that operate at the level of the specific product development (project issues).

2.7 Project Related Issues

The review of strategic issues above shows how the way in which the whole organisations' functions can have an effect on the success or failure of new products. However, the way in which any one specific project is executed, the people involved and the role of information are instrumental in its outcome.

2.7.1 The NPD Process

The process of new product development involves the activities described above. A number of studies have identified the efficient execution of the development process, or particular activities within the development process as critical to NPD success. Kotler (1997), Onkvisit & Shaw (1997), as well as Van Der Merwe & Van Der Merwe (1975).

The models of NPD processes tend to be idealised and for this reason may be quite far removed from reality. A number of authors have researched to what extent the prescriptive activities of the NPD process take place. For this research, the NPD process will be examined from the perspectives of these authors, namely, Kotler (1997), Onkvisit & Shaw (1997), as well as Van Der Merwe & Van Der Merwe (1975).

Onkvisit & Shaw (1997) identify 6 distinct steps in NPD. Kotler (1997) identifies two more steps namely Concept development and Marketing strategy development. When integrated, the steps suggested will take the following form:

- Generation of new product ideas
- Preliminary screening of new ideas
- Concept development
- Marketing strategy development
- Business analysis of the project

- Product development
- Test marketing
- Commercialisation

These steps will not be detailed in this literature review, but it is important to note the types of issues that need to be considered in making decisions throughout the NPD process. According to Kotler (1997:312) the following criteria must be met before moving on to the next step:

- Idea Generation: The particular idea is worth considering.
- Idea screening: The product idea is compatible with company objectives, strategies, and resources.
- Concept development: A good concept for the product that end-users say they would try can be developed.
- Marketing strategy development: A cost-effective, affordable marketing strategy can be developed
- Business analysis of the project: This product will meet our profit goal.
- Product development: A product that is sound technically and commercially has been developed.
- Test marketing: Product sales have met our expectations. The idea does not need to be sent back for product development.
- Full-scale commercialisation: Product sales are meeting our expectations.

Van Der Merwe & Van Der Merwe (1975:150) emphasise the following issues as being important in order for the NPD process to be successfully carried out, most of which supports Kotler's criteria.

- The new product must achieve the company's profitable objectives
- The new product must meet company criteria for sales, market share and product increases
- The company has the financial resources required for NPD
- Management has the skills and time needed for NPD
- The new product should fit in with overall company image and overall objectives

There is a greater probability of commercial success if all the process activities are completed. While it may be desirable to have a complete process of NPD, each additional activity extends the overall development time and may lead to late market introduction. There can be a price to pay for late market introduction. A trade-off has to be made between completing all the suggested activities in the new product development process and the time, which these activities take. (Baker & Hart, 1999)

In recognition of the time pressures facing those developing new products, Cooper (1988:246) suggests that there should be 'parallel processing'. Benefits of the parallel approach are the reduction to time to market, a smoother transition between phases and therefore avoidance of the bottlenecks, which often occur, in a sequential process.

(Takeuchi & Nonaka, 1986:68) Other benefits of this approach include a number of 'soft' advantages relating to people involved, such as shared responsibility, co-operation, involvement, commitment, sharpened problem-solving focus, initiative, diversified skills and heightened sensitivity toward market conditions.

The above discussion relates to the research, which focuses on the particular activities of the development process, but the extent to which the activities can or cannot be effectively carried out demands attention to the people, or functions, within the process. These issues will now be discussed.

2.7.2 Staff

People involved in the NPD process and the way in which these people are organised are critical factors in the outcome of NPD. The Stanford Innovation Project (Maidique & Zirger, 1984) identified functional co-ordination as a critical factor contributing to the development of successful new products. High performing companies value cross-functional skills, while other companies pride themselves on their functional strengths. (Nevens, Summe, & Uttal, 1991:65) Building excellent cross-functional skills is a challenge, especially because structures and habits work against them. People identify with their profession and usually want to get better at what they do. And most day-to-day work is functional specific. But functional excellence alone does not ensure that a company will be competitive.

Instead, a holistic or "rugby" approach - where a team tries to go the distance as a unit, passing the ball back and forth - may better serve today's competitive requirements. (Takeuchi & Nonaka: 1991:67) Under the rugby approach, the product development process emerges from the constant interaction of handpicked, multidisciplinary teams whose members work together from start to finish. Rather than moving in defined, highly structured stages, the process is born out of the team members' interplay. (Takeuchi & Nonaka: 1991: 68) The higher the level of cross-functional co-operation, the more successful the outcome of new product development.

The close relationship between functional co-ordination and an integrated set of new product development activities has also been emphasised by Larson & Gobeli (1988), including the reduction of the development cycle time, cost savings and closer communication so that potential problems are detected very early on in the process. Takeuchi and Nonaka (1991) who refer to this approach as the overlapping approach or Sashimi in Japanese, also found that this integration enhances shared responsibility and co-operation, stimulates involvement and commitment, sharpens a problem-solving focus, encourages initiative taking, develops diversified skills, and heightens sensitivity toward market conditions. NPD should be accomplished by what Takeuchi & Nonaka (1991:71) call "shared division of labour", where each team member feels responsible for and is able to work on any aspect of the NPD project.

The literature has shown that the people who are involved in the NPD process from a variety of functions must work together, if developments are to be successful. However, achieving functional integration (especially of the R&D and marketing functions) is a difficult issue to resolve. The sharing of information, organisation of development teams and effective leadership has been suggested as ways in which this problem could be resolved.

2.7.3 Information

The role which information can play in facilitating an efficient NPD process and achieving functional co-ordination is implicit in the literature on success in NPD. The notion of reducing uncertainty as the main objective of the project development activities is reiterated throughout the literature: project activities can be considered as discrete information processing activities aimed at reducing uncertainty. These activities include gathering and disseminating information and making decisions based upon this information, which must include evaluations of both the market and technical aspects of the development project.

Good information improves all decisions, including decisions on what and how to innovate. Fortunately, these innovation decisions do not each need a completely new set of data. It may be necessary to rearrange the information somewhat from case to case. But once a way of collecting salient facts about the company, its customers, the marketplace and the competitors and about the wider operating environment is in place, company executives will be well placed to spot the clues to what and how the

company should innovate. The trick of course is to recognise the clues when they are seen, and to know how to respond to them; "to turn clues into cues" (Ball & Anthony, 1989:97).

The role of information is important in NPD for achieving product advantage. (Baker & Hart, 1999:173) Technical and marketing information, which are the building blocks of NPD, have to be both accurate and timely, and must be constantly reworked in the light of changing circumstances during the course of the development, to ensure that the product under development does have competitive advantage in the eyes of the customers.

What is really new and is having a more fundamental impact on how companies handle innovation is the involvement of technology in the way in which companies assimilate, organise and use information or knowledge. Access to the technology of knowledge is becoming one of the resources for innovation in the future. (West, 1992:130) Research is increasingly suggesting that technical support for knowledge is central to effective innovation, for example, Asmal & Kahn (2000) in their studies on the knowledge economy and Botha (2000) in his research on the knowledge-based enterprise. Knowledge is recognised as a company's most valuable asset and strategic resource in the creation of a competitive advantage. The ability and capacity to manage this recently accentuated intangible asset is fast becoming the most emphasised and critical executive skill for the management of a knowledge-based enterprise. (Botha, 2002:141)

West (1992:132) refers to this management of information as "knowledge management". Networked processing systems, units that could work alone yet be part of the overall business knowledge environment is in great demand. Networking speeds communications and can cut costs during the NPD process. Centralisation of information is the key: for staff able to feed the centre with new ideas for product development, and for the centre able to keep the periphery informed of changes in the environment that might supply new opportunities. Centralised databases are important in resolving problems by giving valuable support to NPD. They can also substantially improve the available resources to bring product concepts rapidly from the idea stage into the screening stage. Information, therefore, is a base currency of the NPD process. Evaluative information is crucial and must be efficiently disseminated to facilitate communication

This review of research into the correlates of success and failure in NPD does not claim to be exhaustive, but it does give a flavour of the variety of issues and disciplines central to furthering our understanding of the process of innovation and new product development.

2.8 A Model for Successful New Product Development

The following model is based on the review of the issues relating to the seven factors influencing NPD success. Broadly, it is expected that New Product Development should be successful if the various factors stated in the model are complied with.

Table 2.1: A Model for Successful New Product Development

New Product Development should be more successful if:

FACTORS INFLUENCING NPD	CONTRIBUTED BY:
SECTION ONE: Corporate Strategy	
1. New Product Development is guided by the corporate goals of the company	• Cooper & Kleinschmidt (1992)
2. Objectives for NPD project are clearly defined	• Cooper & Kleinschmidt (1992)
3. Corporate strategy does not restrict or stifle the creativity necessary for NPD	• Baker & Hart (1999)
4. There is a fusion between technology-led and market-led innovations at the strategic level	• Johne & Snelson (1988)
5. High levels of synergy (i.e. the relationship between NPD & existing activities) exists within the company	• Baker & Hart (1999)
6. The climate in the company accepts risks in the NPD process	• Baker & Hart (1999)
7. Product development is the most favoured method of achieving corporate growth	• Financial Mail (1998)
8. Aggressive strategies are utilised, favouring market penetration and market development during NPD	• Davis (1997)
9. The product strategy maximises company goals	• Crawford (1991)

FACTORS INFLUENCING NPD	CONTRIBUTED BY:
SECTION TWO: The Role of Management	
10. A high level of top management support exists in the process of product innovation	• Maidique & Zirger (1984)
11. Senior management are committed and involved at all stages of the NPD process	• West (1992)
12. Company executives encourage a culture of innovation and entrepreneurship	• West (1992)
13. Top management defines the company culture	• Ball & Asbury (1989)
14. Management style is appropriate to the demands of product innovation	• West (1992)
15. There are fewer layers of authority to speed the process of innovation	• West (1992)
16. Top management is responsible for good communication and free-flow of information amongst NPD project team members	• Ball & Asbury (1989)
17. Top management combines technical commitment with marketing inputs	• Hart & Service (1988)

FACTORS INFLUENCING NPD	CONTRIBUTED BY:
SECTION THREE: Organisational Culture	
18. Experimentation is encouraged	• Baker & Hart (1999)
19. More time is consciously dedicated to thinking	• Baker & Hart (1999)
20. Free-flow of information id encouraged between employees	• Baker & Hart (1999)
21. Staff members share a common perception about the tasks in NPD project	• West (1992)
22. Positive internal attitude exists between staff members	• West (1992)
23. High levels of shared values characterise the company culture	• West (1992)
24. Tasks are designed around co-operative teamwork	• West (1992)
25. Harmony and stability are emphasised	• West (1992)

26. Considerable job mobility exists	• West (1992)
27. Work smarter, not harder philosophy is applied	• West (1992)
28. Suggestions are welcomed	• West (1992)

FACTORS INFLUENCING NPD	**CONTRIBUTED BY:**
SECTION FOUR: Organisational Structure	
29. Organisational structure is free from rigid rules	• Rothwell & Whiston (1990)
30. A participative and informal organisational style exists	• Rothwell & Whiston (1990)
31. Many views are aired and considered	• Rothwell & Whiston (1990)
32. Face-to-face communication exists with little 'red tape'	• Rothwell & Whiston (1990)
33. Creative interaction and aims are emphasized	• Rothwell & Whiston (1990)
34. Organisational structure is flexible with respect to changing needs, threats and opportunities	• Rothwell & Whiston (1990)
35. Organisational structure is non-hierarchical	• Rothwell & Whiston (1990)
36. Information flows downwards as well as upwards	• Rothwell & Whiston (1990)
37. Co-ordination within the NPD project team is undertaken by experts with a technical background in the area, and not a superior with authority from outside	• Mintzberg (1991)
38. Power in the NPD projects team is distributed among the experts where appropriate	• Mintzberg (1991)

FACTORS INFLUENCING NPD	CONTRIBUTED BY:
SECTION FIVE: The NPD Process	
39. The product idea is compatible with company objectives, strategies and resources	Kotler (1997) and Van Der Merwe & Van Der Merwe (1975)
40. The concept of the new product is good enough for the end-users to say they would want to try the product	Kotler (1997)
41. The marketing strategy to be developed for the new product is cost-effective and affordable	Kotler (1997)
42. The new product meets profit goals	Kotler (1997) and Van Der Merwe & Van Der Merwe (1975)
43. The new product is technically as well as commercially sound	Kotler (1997)
44. The new product meets company criteria for sales and market share	Kotler (1997) and Van Der Merwe & Van Der Merwe (1975)
45. The idea does not need to be sent back for product development	Kotler (1997)
46. Management has the skills and time needed for NPD	Van Der Merwe & Van Der Merwe (1975)
47. The company has the financial resources required for NPD	Van Der Merwe & Van Der Merwe (1975)

FACTORS INFLUENCING NPD	CONTRIBUTED BY:
SECTION SIX: Staff	
48. Functional co-ordination is identified as a critical factor contributing to the development of the new product	• Maidique & Zirger (1984)
49. Cross-functional skills are highly valued in the company	• Nevens, Summe & Uttal (1991)
50. Team members work together from start to finish during the NPD process	• Takeuchi & Nonaka (1991)
51. Teams are multi-disciplinary/multi-skilled	• Takeuchi & Nonaka (1991)
52. There is a close relationship between functional co-ordination and the NPD process	• Larson (1989)
53. Team members feel responsible for and is able to work on any aspect of the NPD project	• Takeuchi & Nonaka (1991)

FACTORS INFLUENCING NPD	CONTRIBUTED BY:
SECTION SEVEN: Information	
54. Good and reliable information is available for making improved decisions about what and how to innovate	• Ball and Asbury (1989)
55. The role of information is considered important in the NPD process for achieving product advantage	• Ball and Asbury (1989)
56. Technical and marketing information are both accurate and timely in the NPD process	• Baker and Hart (1999)
57. Information is constantly reworked at in the light of the changing circumstances during the NPD process	• Baker and Hart (1999)
58. Technical support for knowledge is available	• Botha(2000)and Asmal &Khan(2000)
59. Centralised data bases are available for supporting NPD within the company	• West (1992)
60. Networking of information speeds communications and cuts costs during the NPD process	• West (1992)

CHAPTER 3 THE CASE STUDY: CMG-WIRELESS DATA SOLUTIONS

3.1 Introduction

This chapter introduces the company that is being evaluated in this particular research study that uses the case study approach. It includes a brief history of CMG-Wireless Data Solutions, the acquisition and the organisational structure. The chapter will also share some insight into the EPPIX Customer Care and Billing System - the "new product" that will be referred in the research questionnaire. A short summary of the product's positioning will be discussed as well as the telecommunications market. Even though the study is not of a technical nature, it is important to gain an understanding of what exactly is being produced in order to apply the findings and give recommendations appropriately for successful NPD.

3.2 Background of the Company

The company was partially acquired and given the name Computer Answers International Limited (CAIL) and headquartered in Birmingham, England. By the end of 1993, CAIL had ventured into the Australian and South African markets. Their focus was on tailoring their product to suit their clients businesses. As a result of the varied requirements of many clients the product was split into different versions. EPPIX CCBS was no longer a generic product for the GSM market, but was evolving into a client specific solution. In 1996, CAIL won a client in Mauritius, which was their first GSM Mobile Network client and was embarking on an aggressive sales

spree into Africa. In April 1999, there was a management buy-out of CAIL. Employees were given share options in the company. (Goko, Krishinchand, Maesela, Ngwepe, Singh & Pather, 2002:2)

3.3 Acquisition by CMG Plc

In July 2000, CMG Plc acquired CAIL for 60 million British pounds. CMG Plc headquartered in Utrecht, Holland was a telecommunication solutions provider that operated in the Tier 1 market in Europe. The intention of acquiring CAIL was to compliment the CMG product suite, which consisted of a Short Message Service Centre (SMSC), Cell Broadcast System (CBS), Wireless Service Broker (WSB) and Unified Messaging (UM). (CMG, 2000:11)

3.4 Company Structure

After the acquisition of the EPPIX CCBS, CMG structured the company as follows:

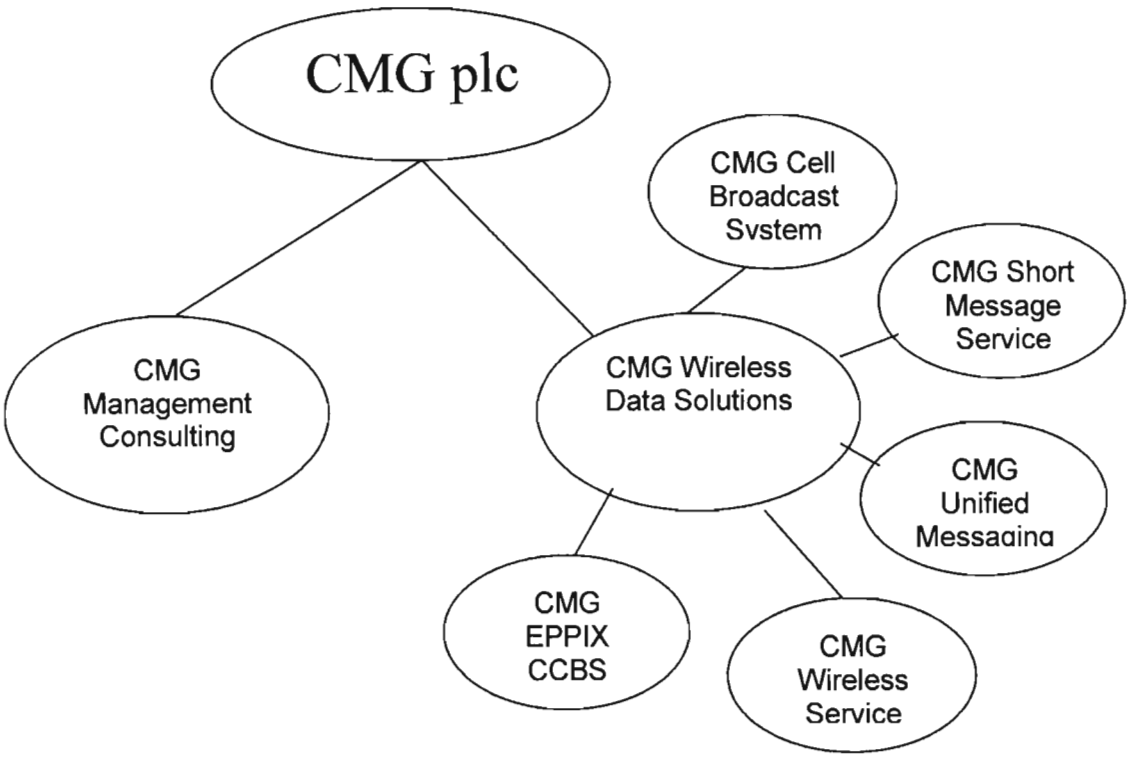


Figure 3.1: CMG Company Structure

The organisation was structured around 2 main divisions viz. the Management Consulting division and the Wireless Data Solutions (WDS) division. All telecommunications products were grouped as separate business units under the WDS division. The motivation for the above structure was to be able to easily track the profitability of each division and to manage each business unit with its own profit and loss statement. The CMG SMSC business unit was the "cash cow" of the WDS division and the EPPIX CCBS was showing significant losses since acquisition from CAIL.(Refer to Appendix 7)

3.5 The New Product

The EPPIX Customer Care and Billing System (EPPIX CCBS) was born in the early 1990's. The CCBS product was aimed at GSM mobile service providers in the Tier 2 and 3 markets:

- Tier 1 – network operator with more than 3 million subscribers
- Tier 2 – network operator with between 1 million to 3 million subscribers
- Tier 3 – network operator with less than 1 million subscribers

Product Development of the EPPIX Customer Care and Billing System will be evaluated in this study. The EPPIX CCBS is the "New Product" that will be referred to in this study. According to the academics in the field of New Product Development (Refer to Chapter 2) , the EPPIX CCBS can be classified, in terms of its newness to the company and to the marketplace, as "a product that provides improved performance or greater perceived value and replaces existing products with the later version" (Booz, Allen & Hamilton, 1982). In this sense, CMG's product is a "new product". It is an improved product that is a development of existing products representing a meaningful alteration. (Seres, 1978) (Refer to Appendix 10 for the EPPIX CCBS Product enhancements)

3.6 Product Positioning

In July 2000 the EPPIX CCBS business unit was still under the stewardship of the previous CAIL management team but with direct reporting lines to the WDS management team. CAIL's focus was the Tier 2 & 3 markets. CMG WDS focused on the Tier 1 market. The EPPIX CCBS Business Unit was tasked with developing the product to focus on Tier 1 markets after the acquisition, where CMG WDS held the market share for Network Telecom Products.

With the EPPIX CCBS Business Unit being tasked with this transformation, it resulted in the company focusing all its attention on internal product development. The company envisaged moving from $2/3 million projects to $20/30 million projects. This resulted in the company gearing itself towards penetrating the tier 1 market. To achieve this, the company embarked on a recruitment drive. However it failed to focus on internal processes and systems and service delivery mechanisms. The market focus had changed but the organisation had failed to evolve. (Goko, Krishinchand, Maesela, Ngwepe, Singh & Pather, 2002:4)

3.7 The Telecommunications Market

Given the ever-dynamic nature of the telecommunications business and the impact of technological changes, any company involved in this industry has to respond or be prepared to fail. The march of technology has managed to quickly alter the existing landscape calling for new and different ways of looking at customer care and billing for telecommunications services.

As the (African) telecommunications industry continues to demonstrate unparalleled growth in infrastructure and market penetration, network operators and vendors alike are challenged with the demands and expectations of an increasingly sophisticated subscriber base. Key industry players are required to implement significant technological innovations to support the ever-growing requirements of the market. At the forefront of these challenges is CMG-Wireless, a telecommunications solutions provider, whose product, the EPPIX Customer Care and Billing System, is still the most popular CCBS for Africa. (BMI-TechKnowledge, 2002:104)

Launched in the African market in 1993, the EPPIX product has proved popular with operators across the African continent including MTN, Vodacom Service Provider, Mascom Wireless (Botswana), Al Madar (Libya), Mobitel (Sudan), Tritel (Tanzania), Sonatel Mobile (Senegal), Econet Wireless (Zimbabwe), Ghana Telecom and Econet Wireless in Nigeria among others. Part of the product's success has been in providing an affordable solution to cater for both pre and post-paid subscribers within one system. (BMI-TechKnowledge, 2002:98)

While ideal for start-up operators, EPPIX does not focus solely on tier two and tier three network operators, a point proved by recent successful benchmarking to 3.2 million subscribers. This was key to its integration into the CMG Wireless Data Solutions product portfolio and future strategy. CMG Wireless Data Solutions added the EPPIX customer care and billing system to its product line in 2000, as its first

major acquisition. This was to provide their clients with an end-to-end, data-enabled solution, allowing network operators and service providers to bill for the advanced information services that other CMG products enabled them to offer. (BMI-TechKnowledge, 2002:98)

Another major point in the product's development, also announced at GSM World Congress 2001, is that EPPIX will support the Oracle database in a version that was released in May this year. Following the positive results of the recent benchmarking, this announcement is another significant step in the product's integration within CMG's total solution strategy, which focuses on ensuring customer profitability. Many of CMG Wireless Data Solutions' clients are tier one. EPPIX's ability to support Oracle, the most popular database within the tier one market, is a critical requirement for the product that up until now has been Informix dependent. (BMI-TechKnowledge, 2002:98)

In light of this new product development, does CMG have what it takes to survive in this industry? Does CMG possess the key characteristics of a leading innovator to beat the competition in the marketplace? This research study aims to answer these questions through evaluation of the company's New Product Development strategy. It is the objective of this study to evaluate the key factors of CMG's organisation that are required for continuous new product development success.

It is quite common for a company to estimate its competitors' success as benchmarks against which to compare its own success. An example of a leading innovator, as indicated by BMI-TechKnowledge (2000:28), is Ericsson, a company whose successful strategy can be used as a benchmark in the telecommunications industry. Ericsson is a leading global provider of both fixed and mobile network infrastructures. Ericsson's commanding position as the leader in mobility together with its strength in data communications firmly establishes Ericsson's position as a significant player in the new telecommunications world. Ericsson has achieved success as the leader in mobile communications technology. Ericsson's success has been built on innovations and so has the company's future.

Working at Ericsson means working at the forefront of communications technology. Together with the development of leading edge technology, Ericsson's strengths also stem from internal factors such as its corporate culture, internal commitment, being employee-focussed, concentrating efforts into competence and skills transfer, research and development, as well as being multi-functional. Decades of commitment to R & D make the company the prime incubator for entrepreneurs and a constantly nurturing innovative climate. These are but are few of the organisational issues that impact on their reputation as a leading innovator. In evaluating CMG's new product development strategy, the above characteristics as well as other organisational factors contributing to new product development success identified from the literature review, will be the focus of attention in this research study.

CHAPTER 4 RESEARCH METHODOLOGY

4.1 Research Type

The case study approach was used for this research project. This research study was concerned with exploring, describing and explaining the key organisational factors for successful New Product Development and can therefore be called a descriptive study. CMG-Wireless Data Solutions was the company that was studied. The study was a typical case study. This research type was more suitable for this dissertation since it was a small-scale, cross-sectional research and appealed to the researcher due to time constraints and a limited budget.

4.2 Method of Data Collection

The research design was cross-sectional and the method triangulation research approach was applied. The qualitative approach was initially used as a secondary method in the form of a semi-structured questionnaire for the pilot study. This qualitative data from the exploratory first stage was then used as the basis for collecting and interpreting the quantitative data that was the primary data collection method in the form of a structured survey questionnaire for the main study.

4.3 Pilot study: Qualitative

The objectives of the pilot study was to:

- Test the concepts and constructs that had been extracted from the literature review
- Refine the research questions of the measuring instrument for the main study
- Test the level of importance and relevance of the factors of successful new product development obtained from the literature review

The pilot study took the form of semi-structured self-administered questionnaires that was sent via e-mail to the participants. (Refer to Appendix 2 for pilot study questionnaire) Participants were chosen on the basis of their authoritative power in the process of new product development at CMG, as well as their availability to the researcher. The questions in the pilot study were targeted at management because of the level of strategic content. The pilot questionnaire was based on the McKinsey's 7Ss Framework and included the selected factors to be further explored in the main study. The McKinsey's 7Ss Model was used as a framework for analysis of the NPD Strategy. (Refer to Appendix 3 for McKinsey's 7Ss framework)

4.4 Main study: Quantitative

A questionnaire was constructed based on the factors arising from the literature review and pilot study. The survey questionnaire consisting of 60 Likert-scale questions was sent to 15 product group team members including management. The questionnaire was viewed as an instrument designed to meet the research objectives stated in Chapter One of this research study. The research objective of this study was

to evaluate the key success factors of CMG's New Product Development (NPD) Strategy and to investigate the relationship between the various factors.

4.5 Questionnaire Design

The research questionnaire was divided into two parts. Part A consisted of questions relating to the factors of New Product Development success and Part B contained demographic information.

Part A

The following list of issues which were developed from the theory base in Chapter Two are repeated here for ease of reference as well as to demonstrate how the statements in the main study are linked to this model.

Table 4.1: A Model for Successful New Product Development

New Product Development should be more successful if:

FACTORS INFLUENCING NPD	
SECTION ONE: Corporate Strategy	
01.	New Product Development is guided by the corporate goals of the company
02.	Objectives for NPD project are clearly defined
03.	Corporate strategy does not restrict or stifle the creativity necessary for NPD
04.	There is a fusion between technology-led and market-led innovations at the strategic level
05.	High levels of synergy (i.e. the relationship between NPD & existing activities) exists within the company
06.	The climate in the company accepts risks in the NPD process
07.	Product development is the most favoured method of achieving corporate growth
08.	Aggressive strategies are utilised, favouring market penetration and market development during NPD
09.	The product strategy maximises company goals

FACTORS INFLUENCING NPD	
SECTION TWO: Role of Management	
10.	A high level of top management support exists in the process of product innovation
11.	Senior management are committed and involved at all stages of the NPD process
12.	Company executives encourage a culture of innovation and entrepreneurship
13.	Top management defines the company culture
14.	Management style is appropriate to the demands of product innovation
15.	There are fewer layers of authority to speed the process of innovation
16.	Top management is responsible for good communication and free-flow of information amongst NPD project team members
17.	Top management combines technical commitment with marketing inputs
SECTION THREE: Organisational Culture	
18.	Experimentation is encouraged
19.	More time is consciously dedicated to thinking
20.	Free-flow of information id encouraged between employees
21.	Staff members share a common perception about the tasks in NPD project
22.	Positive internal attitude exists between staff members
23.	High levels of shared values characterise the company culture
24.	Tasks are designed around co-operative teamwork
25.	Harmony and stability are emphasized
26.	Considerable job mobility exists
27.	Work smarter, not harder philosophy is applied
28.	Suggestions are welcomed
SECTION FOUR: Organisational Structure	
29.	Organisational structure is free from rigid rules
30.	A participative and informal organisational style exists
31.	Many views are aired and considered
32.	Face-to-face communication exists with little 'red tape'
33.	Creative interaction and aims are emphasized
34.	Organisational structure is flexible with respect to changing needs, threats and opportunities
35.	Organisational structure is non-hierarchical
36.	Information flows downwards as well as upwards
37.	Co-ordination within the NPD project team is undertaken by experts with a technical background in the area, and not a superior with authority from outside
38.	Power in the NPD projects team is distributed among the experts where appropriate

FACTORS INFLUENCING NPD	
SECTION FIVE: The NPD Process	
39.	The product idea is compatible with company objectives, strategies and resources
40.	The concept of the new product is good enough for the end-users to say they would want to try the product
41.	The marketing strategy to be developed for the new product is cost-effective and affordable
42.	The new product meets profit goals
43.	The new product is technically as well as commercially sound
44.	The new product meets company criteria for sales and market share
45.	The idea does not need to be sent back for product development
46.	Management has the skills and time needed for NPD
47.	The company has the financial resources required for NPD
SECTION SIX: Staff	
48.	Functional co-ordination is identified as a critical factor contributing to the development of the new product
49.	Cross-functional skills are highly valued in the company
50.	Team members work together from start to finish during the NPD process
51.	Teams are multi-disciplinary/multi-skilled
52.	There is a close relationship between functional co-ordination and the NPD process
53.	Team members feel responsible for and is able to work on any aspect of the NPD project
SECTION SEVEN: Information	
54.	Good and reliable information is available for making improved decisions about what and how to innovate
55.	The role of information is considered important in the NPD process for achieving product advantage
56.	Technical and marketing information are both accurate and timely in the NPD process
57.	Information is constantly reworked at in the light of the changing circumstances during the NPD process
58.	Technical support for knowledge is available
59.	Centralised data bases are available for supporting NPD within the company
60.	Networking of information speeds communications and cuts costs during the NPD process

In Part A of the questionnaire, the respondents were asked to indicate their responses to the statements on a 5-point Likert Scale. The scale ranged from 'Strongly Disagree' (a score of 1) to 'Strongly Agree' (a score of 5). Selected statements were phrased in the negative, to encourage definitive opinions. (Refer to Appendix 1 for the Introductory Letter and Questionnaire)

The use of a five point Likert Scale was to allow the respondents the opportunity to rank their responses to each statement and also for the purposes of quantitative analysis. Part A of the questionnaire is directly linked to the model that was developed in Chapter Two (See Table 2.1.). For ease of reference Table 4.1 above represents the model for successful NPD.

The overall objective of Part A of the Questionnaire was to evaluate the key success factors of CMG's New Product Development (NPD) Strategy. This research objective was sub-divided into further objectives as follows; therefore the Questionnaire was split accordingly:

4.5.1 To evaluate CMG's strategic management factors of NPD (Section 1 to Section 4)

4.5.2 To evaluate CMG's project-related factors of NPD (Section 5 to Section 7)

4.5.3 To explore the relationship between the seven key success factors at CMG.

4.5.4 To explore the relationship between CMG's strategic management and project management.

Section One of Part A of the questionnaire was linked to Section One of the model relating to issues of Corporate Strategy. The purpose of this section was to investigate CMG's corporate strategy in relation to NPD.

The scale in the following refers to: 1=Strongly Disagree, 2=Disagree; 3=Do not agree or disagree; 4=Agree; and, 5=Strongly Agree

Factors Influencing New Product Strategy	1	2	3	4	5
SECTION ONE: CORPORATE STRATEGY					
01. New Product Development is guided by the corporate goals of the company					
02. Objectives for new product development projects are clearly defined					
03. Corporate strategy at CMG restricts or stifles the creativity necessary for new product development					
04. There is a fusion between technology-led and market-led innovations at the strategic level					
05. High levels of synergy (i.e. the relationship between New Product Development and existing activities) exist within the company					
06. The climate in the company accepts risks when a new product is being developed					
07. Product development is the most favoured method of achieving corporate growth in your company					
08. Aggressive strategies are utilised favouring market penetration and market development for corporate growth					
09. CMG's new product strategy maximizes company's goals					

Section Two of Part A of the questionnaire was linked to Section Two of the model relating to issues with respect to top management support. The purpose of this section was to investigate CMG's management style in relation to NPD

Factors Influencing New Product Strategy	1	2	3	4	5
SECTION TWO: ROLE OF MANAGEMENT					
10. A high level of top management support exists in the process of product innovation					
11. Senior management are committed and involved at all stages of the NPD process					
12. Company executives encourage a culture of innovation and entrepreneurship					
13. Top management defines the company culture					
14. Management style is appropriate to the demands of product innovation					
15. There are fewer layers of authority to speed the process of innovation					
16. Top management is responsible for good communication and free-flow of information amongst NPD project team members					
17. Top management combines technical commitment with marketing inputs					

Section Three of Part A of the questionnaire was linked to Section Three of the model relating to issues of Organisational Culture. The purpose of this section was to investigate CMG's organisational culture in relation to NPD.

Factors Influencing New Product Strategy	1	2	3	4	5
SECTION THREE: ORGANISATIONAL CUTURE					
18. Experimentation is encouraged					
19. More time is consciously dedicated to thinking					
20. Free-flow of information is encouraged between employees					
21. Staff members share a common perception about the tasks in the NPD project					
22. Positive internal attitude exists between staff members					
23. High levels of shared values characterise the company culture					
24. Tasks are designed around co-operative teamwork					
25. Harmony and stability are emphasised					
26. Considerable job mobility exists					
27. Work smarter, not harder philosophy is applied					
28. Suggestions are welcomed					

Section Four of Part A of the questionnaire was linked to Section Four of the model relating to issues with respect to Organisational Structure. The purpose of this section was to investigate CMG's organisational structure in relation to NPD

Factors Influencing New Product Strategy	1	2	3	4	5
SECTION FOUR: ORGANISATIONAL STRUCTURE					
29. Organisational structure is free from rigid rules					
30. A participative and informal organisational style exists					
31. Many views are aired and considered					
32. Face-to-face communication exists with little 'red tape'					
33. Creative interaction and aims are emphasized					
34. Organisational structure is flexible with respect to changing needs, threats and opportunities					
35. Organisational structure is non-hierarchical					
36. Information flows downwards as well as upwards					
37. Co-ordination within the NPD project team is undertaken by experts with a technical background in the area, and not a superior with authority from outside					
38. Power in the NPD projects team is distributed among the experts where appropriate					

Section Five of Part A of the questionnaire was linked to Section Five of the model relating to issues with respect to the NPD process. The purpose of this section was to investigate CMG's NPD process.

Factors Influencing New Product Strategy	1	2	3	4	5
SECTION FIVE: NPD PROCESS					
39. The product idea is compatible with company objectives, strategies and resources					
40. The concept of the new product is good enough for the end-users to say they would want to try the product					
41. The marketing strategy to be developed for the new product is cost-effective and affordable					
42. The new product meets profit goals					
43. The new product is technically as well as commercially sound					
44. The new product meets company criteria for sales and market share					
45. The idea does not need to be sent back for product development					
46. Management has the skills and time needed for NPD					
47. The company has the financial resources required for NPD					

Section Six of Part A of the questionnaire was linked to Section Six of the model relating to issues regarding the people of the organisation. The purpose of this section was to investigate CMG's staff issues in the NPD process.

Factors Influencing New Product Strategy	1	2	3	4	5
SECTION SIX: STAFF					
48. Functional co-ordination is identified as a critical factor contributing to the development of the new product					
49. Cross-functional skills are highly valued in the company					
50. Team members work together from start to finish during the NPD process					
51. Teams are multi-disciplinary/multi-skilled					
52. There is a close relationship between functional co-ordination and the NPD process					
53. Team members feel responsible for and is able to work on any aspect of the NPD project					

Section Seven of Part A of the questionnaire was linked to Section Seven of the model relating to issues of Information Management. The purpose of this section was to investigate CMG's information systems in relation to NPD

Factors Influencing New Product Strategy	1	2	3	4	5
SECTION SEVEN: INFORMATION					
54. Good and reliable information is available for making improved decisions about what and how to innovate					
55. The role of information is considered important in the NPD process for achieving product advantage					
56. Technical and marketing information are both accurate and timely in the NPD process					
57. Information is constantly reworked at in the light of the changing circumstances during the NPD process					
58. Technical support for knowledge is available					
59. Centralised databases are available for supporting NPD within the company					
60. Networking of information speeds communications and cuts costs during the NPD process					

Part B

Part B of the questionnaire contained questions relating to demographic information that allowed for follow-up as well as any comments regarding the research study.

PART B: CONFIDENTIAL
(a) Your Name:
(b) Your company branch:
(c) Your position:
(d) E-mail address:
(e) Telephone:
(f) Any comments or suggestions you may wish to make considering this research study:

4.6 Method of sampling

The method of sampling chosen for this study was non-random or non-probability. In order to satisfy the research objectives in question, purposive sampling was used because of the case study approach. The group of participants that was selected for the sample was the Product Group of CMG-Wireless Data Solutions because this group was able to provide the most useful information relating to the research questions. The Product Group is directly involved with New Product Development in the company therefore it was most appropriate to have selected this group for the sample. The questionnaire was sent to the entire product group but only 53% of the team members responded.

"The use of non-probability sampling, especially purposive sampling, is said to be ideal with the case study approach" (White, 2000:63)

4.7 Data Analysis

Exploratory data analysis was used for this study because this data method gave the researcher the flexibility to respond to the patterns revealed by the discovery process. The tabulations of the frequencies on the research variables were manipulated to form Graphs and Pie Charts. The tabulations were done using Microsoft Excel. Responses were coded from 1 - 5 (Strongly Disagree to Strongly Agree), and then percentages of the frequencies were calculated. Responses were further summarised into two categories: 1=2=Disagree and 4=5=Agree. This was done for ease during interpretation and was appropriate for reaching the research objectives. (Refer to Appendix 4 for Computer Tabulations of Results)

Descriptive statistics were first used but only frequencies derived from this method could be used to analyse data. (Refer to Appendix 5). The mean scores were calculated for each of the seven key factors, but results were misleading because the distribution contained extreme scores. Consequently, the extreme scores affected the standard deviation. In fact, the mean scores were suggesting that the highest frequency of responses occurred for the category "Neither Agree nor Disagree", which was incorrect. The sample size also played a significant role in limiting the statistical procedures that were available to analyse data. Only 8 out of the 15 questionnaires sent out were answered, which means only 53% of the entire product group selected participated. This could not have been avoided because the product group selected for the sample was made up of only 15 team members. Since the case study approach was used, the focus was on the product group of only one company,

thereby limiting the sample size. But, the descriptive nature of the study, requires a qualitative interpretation of results. Therefore, to reach the objectives of this investigative research study, the use of frequency tables, graphs and charts were the most appropriate means of displaying, presenting and examining data.

4.8 Limitations of the study

It was recognised that due to limited resources and time, the study was restricted, which has potentially limited the scope and generalisation of the research study. Limitations included the following:

- The population targeted for the research was selected on a non-probability and convenience basis. Given the non-probability sampling, the research had no way of forecasting, estimating or guaranteeing that each element in the sample was representative of the population.
- The model derived from the theory base is limited to a small part of new product development. It does not include all the possible key success factors of new product development. Due to the limited time and space of the study it was not practical to research all the factors, but it must be noted that certain factors, which have been excluded, may have very well been just as important as the factors investigated in the study. This study only focussed on internal organisational factors of successful new product development while the external factors, for example, technology and the market have not been included.

CHAPTER 5 RESULTS

5.1 Introduction

This chapter will include the results displayed in relation to the research objectives stated in Chapter One and Five. Graphs and Pie Charts derived from frequency tables were used to present the results. The research objectives were stated for each graph for ease of reference. The findings of the research study were also stipulated as they were presented in the graphs and charts. Frequencies were converted into percentages, so results were explained in terms of percentage of the responses.

5.2 Summarised Results of Part A of the Questionnaire

Research Objectives for Part A of the Questionnaire:

5.2.1 To evaluate the key success factors of CMG's NPD strategy

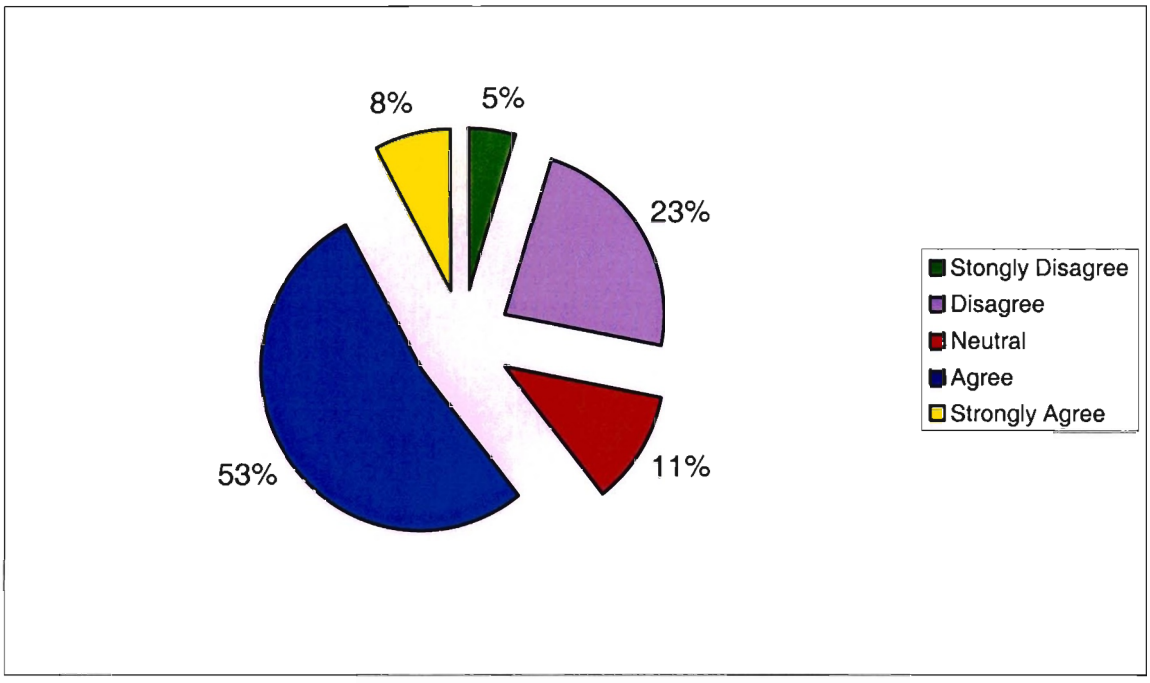


Chart 5.1: Aggregate Response

*Derived from Table 2 Of Appendix 4 for computer tabulations of results

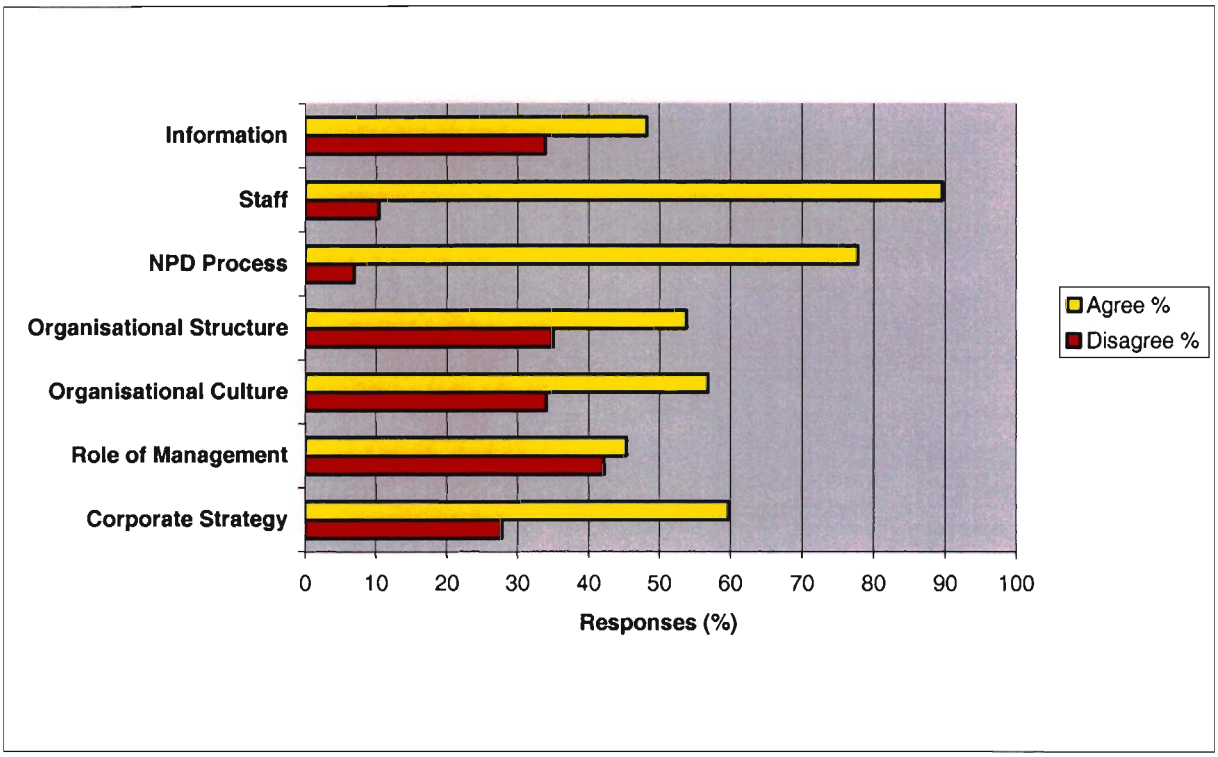
Findings:

- Mode: The highest percentage (53%) of response was found for score 4=Agree, meaning that this was the most frequently occurring score
- The percentage of disagreement was considerably lower (23%) compared to the percentage of agreement (53%)
- There was also a significantly low percentage(8%) of response for score 5=Strongly Agree

NB: For Graphs 5.1 to 5.9, scores have been simplified to form only 2 response categories: 1=2=Agree and 3=4=Disagree for ease of interpretation, where agree represents positive attitudes and Disagree represents negative attitudes.

Chart 5.1, above and Graph 5.1 below, do not however give any significant information specifically about each of the key characteristics within the seven factors. For further interpretation of the key characteristics and in order to gain a more in-depth understanding of the strengths and weaknesses of CMG's New Product Development Strategy, the raw data was manipulated to represent Graphs 5.2 - 5.8.

5.3 Summarised Results of Part A of the Questionnaire (Continued)



Graph 5.1: Relationship between Success Factors of NPD

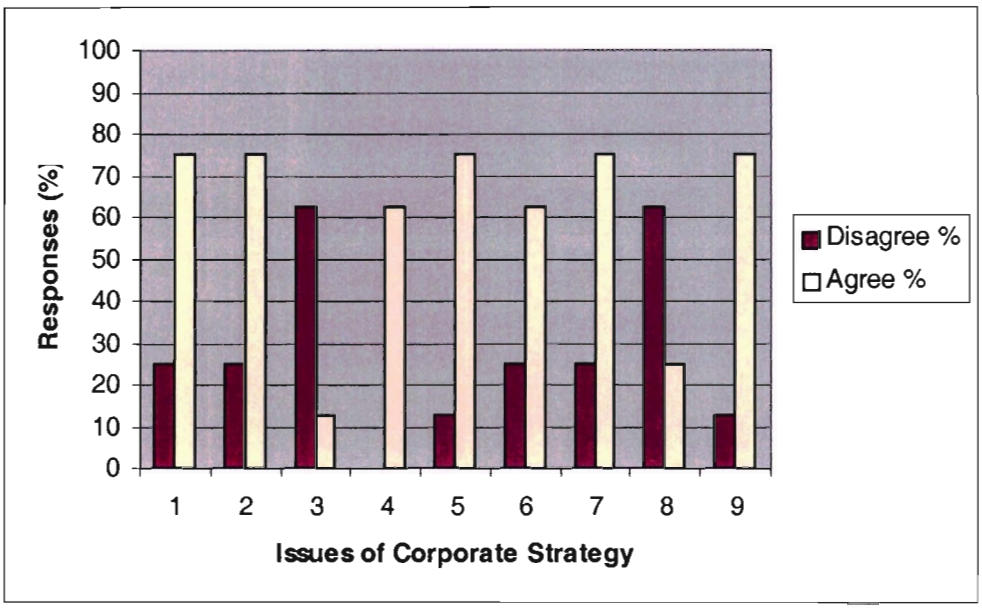
*Derived from Table 10 in Appendix 4
*Raw data from Table 1 in Appendix 4 were summarised further to form Table 10

Findings

- A higher percentage of agreement is illustrated for all seven factors than the percentage of disagreement.
- A higher percentage of disagreement is represented for corporate strategy (28%), role of management(42%), culture(34%), structure(35%) and information(34%) compared to the percentage of disagreement for staff(10%) and the NPD Process(7%).
- The highest percentage of agreement with the lowest percentage of disagreement is indicated for the NPD Process and for Staff

NB: For Graphs 5.2. to 5.8, Raw Data of results were divided into 7 parts to represent individual results of the key factors

5.4 Summarised Results of Section One of the Questionnaire: Corporate Strategy



Graph 5.2: Corporate Strategy

*Refer to Table 3 in Appendix 4 for computer tabulations
*Derived from Raw Data in Table 1 of Appendix 4

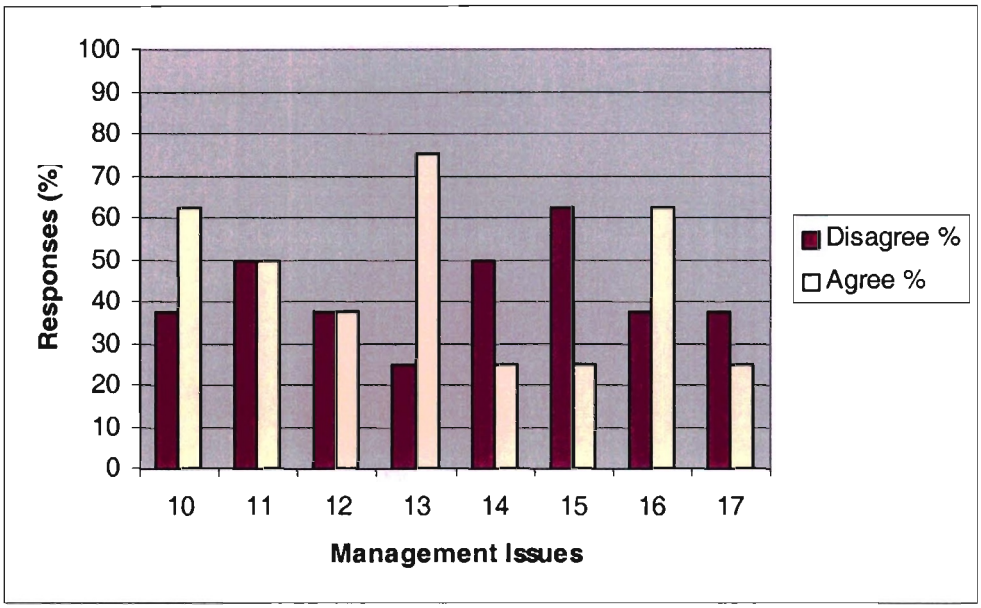
Research Question: Part A - Section One (Question 1 to Questions 9)

Research Objective: To investigate CMG's corporate strategy in relation to New Product Development

Findings:

- A high percentage of agreement together with a low percentage of disagreement is demonstrated for Questions 5 and 9 , representing strengths in the NPD Strategy
- High percentage of disagreement with low percentage of agreement occurred for Questions 3 and 8, representing weaknesses in the NPD Strategy

5.5 Summarised Results of Section Two of the Questionnaire: Role of Management



Graph 5.3: Role of Management

*Refer to Table 4 in Appendix 4 for computer tabulations
*Derived from Raw Data in Table 1 of Appendix 4

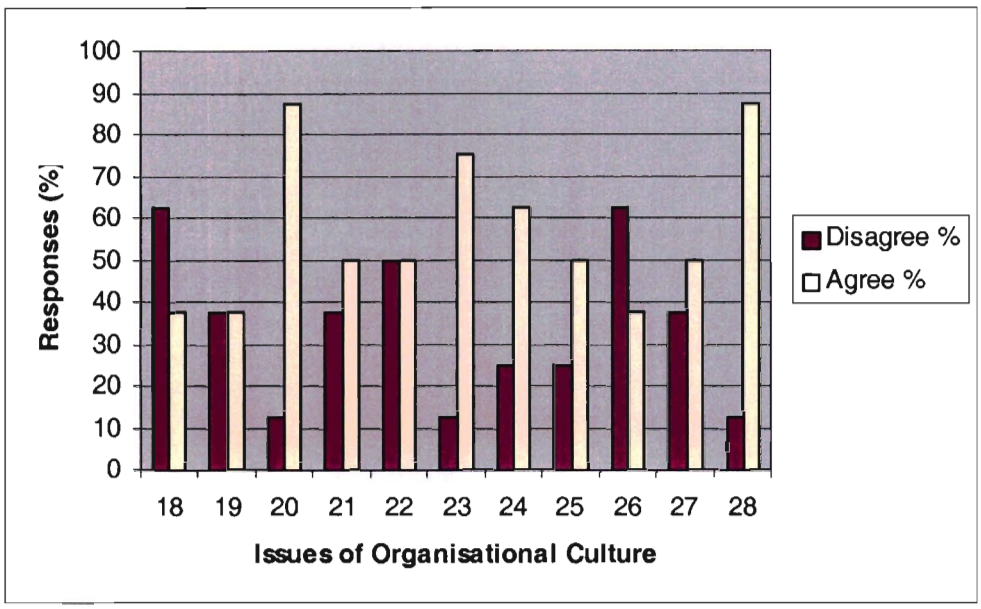
Research Question: Part A - Section Two (Questions 10 to Questions 17)

Research Objective: To investigate CMG's management style in relation to NPD

Findings

- A higher percentage of disagreement occurred for Questions 14(50%) and 15(63%) compared to other questions in this section
- A higher percentage of disagreement (50%) compared to agreement (25%) is shown for Question 14
- The highest percentage of disagreement (62,50%) with one of the lowest percentage of agreement (25%) in this section is indicated for Question 15
- Equal percentages occurred for Question 11. Distribution of frequencies was bimodal for this Question.

5.6 Summarised Results of Section Three of the Questionnaire: Organisational Culture



Graph 5.4: Organisational Culture

*Refer to Table 5 in Appendix 4 for computer tabulations
*Derived from Raw Data in Table 1 of Appendix 4

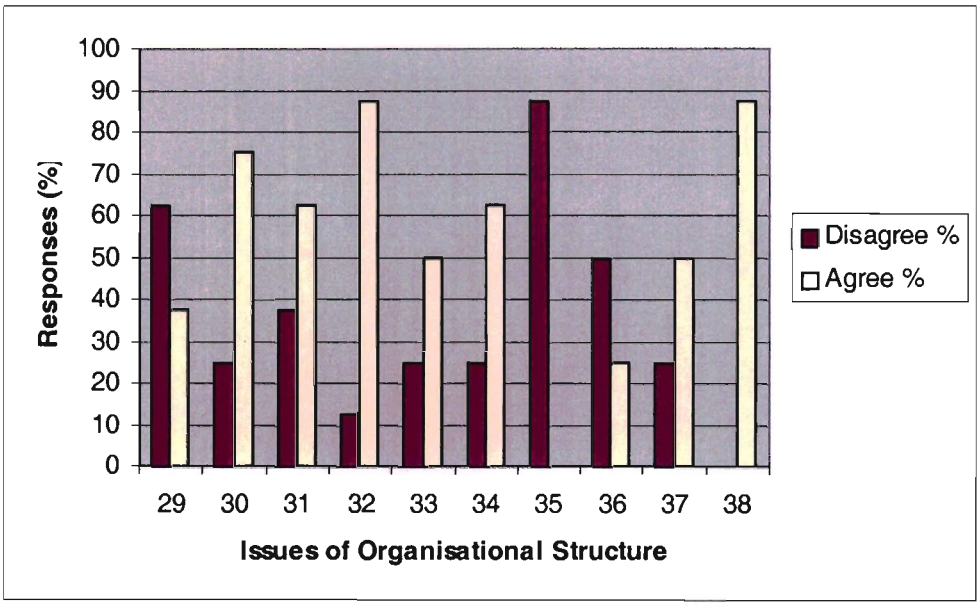
Research Question: Part A - Section Three (Questions 18 to Questions 28)

Research Objective: To investigate CMG's organisational culture in relation to NPD

Findings

- High percentage of agreement plus the lowest percentage of disagreement occurred for Questions 20, 23 and 28.
- The highest percentage of disagreement were found for Questions 18(62,50%) and 26(62,50%) in this section compare to the rest of the Questions
- For Question 26, percentage of disagreement (62,50%) was higher than percentage of agreement (37,50%).
- For Question 22, equal percentages occurred for agree (50%) and disagree (50%).

5.7 Summarised Results of Section Four of the Questionnaire: Organisational Structure



Graph 5.5: Organisational Structure

*Refer to Table 6 in Appendix 4 for computer tabulations.
*Derived from Raw Data in Table 1 of Appendix 4

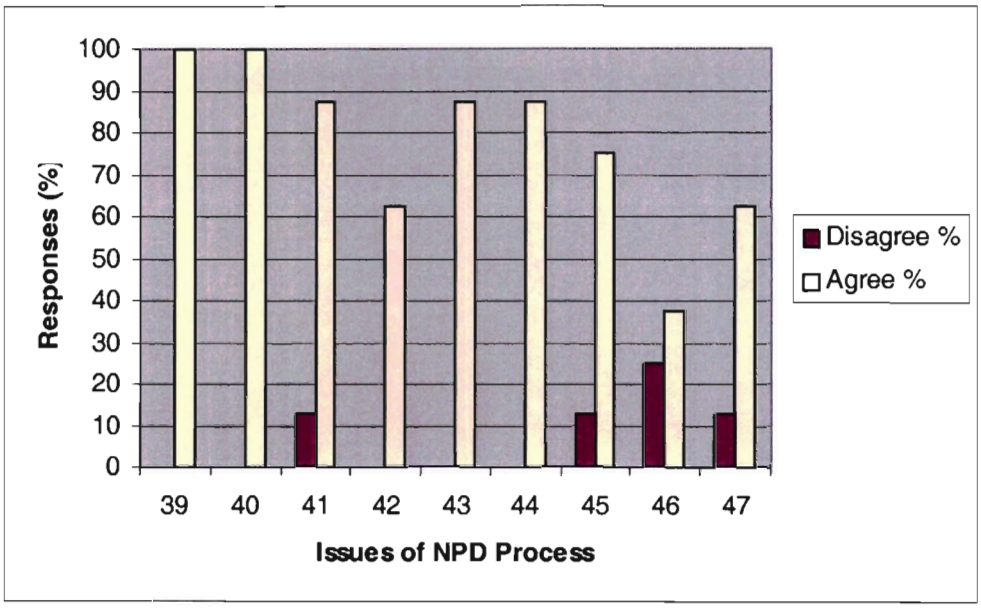
Research Question: Part A - Section Four (Questions 29 to Questions 38)

Research Objective: To investigate CMG's organisational structure in relation to NPD

Findings

- A high percentage of disagreement occurred for Questions 29(62,50%) and 35(87,50%)
- There was 0% of agreement for Question 35
- A higher percentage of agreement occurred for Questions 31 (62,50%), 32(87,50) and 38(87,50%)
- There was 0% of disagreement for Question 38

5.8 Summarised Results of Section Five of the Questionnaire: The NPD Process



Graph 5.6: NPD Process

*Refer to Table 7 in Appendix 4 for Computer Tabulations
*Derived from Raw Data in Table 1 of Appendix 4

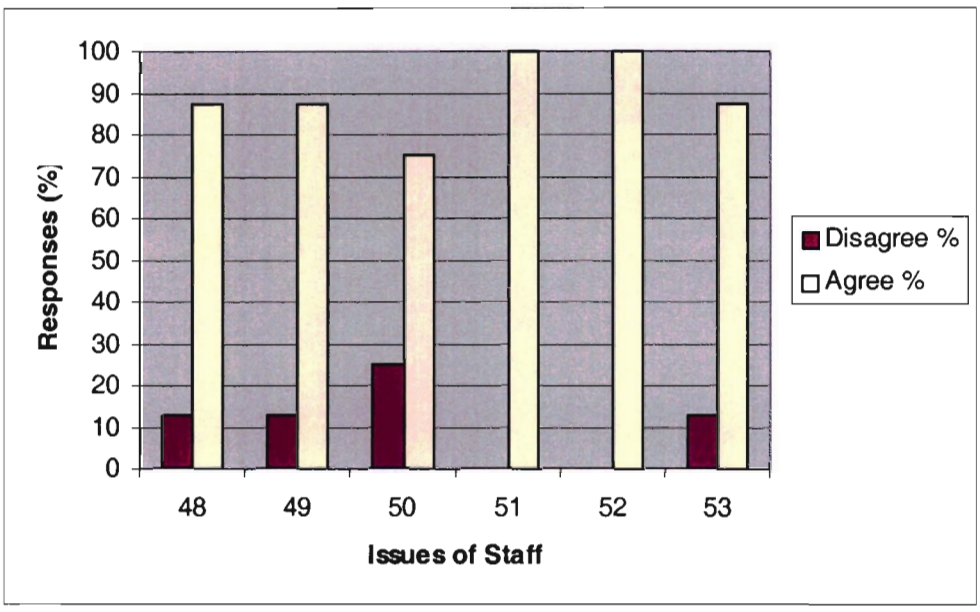
Research Question: Part A - Section Five (Questions 39 to Questions 47)

Research Objective: To investigate CMG's NPD process

Findings

- A low percentage of disagreement occurred for Questions 41(12,50%), 45 (12,50%), 46 (25%) and 47 (12,50%) compared to the overall high percentage of agreement for the other Questions
- The highest percentage of disagreement from the above questions occurred for Question 46

5.9 Summarised Results of Section Six of the Questionnaire: Staff



Graph 5.7: Staff

*Refer to Table 8 in Appendix 4 for computer tabulations
*Derived from Raw Data in Table 1 of Appendix 4

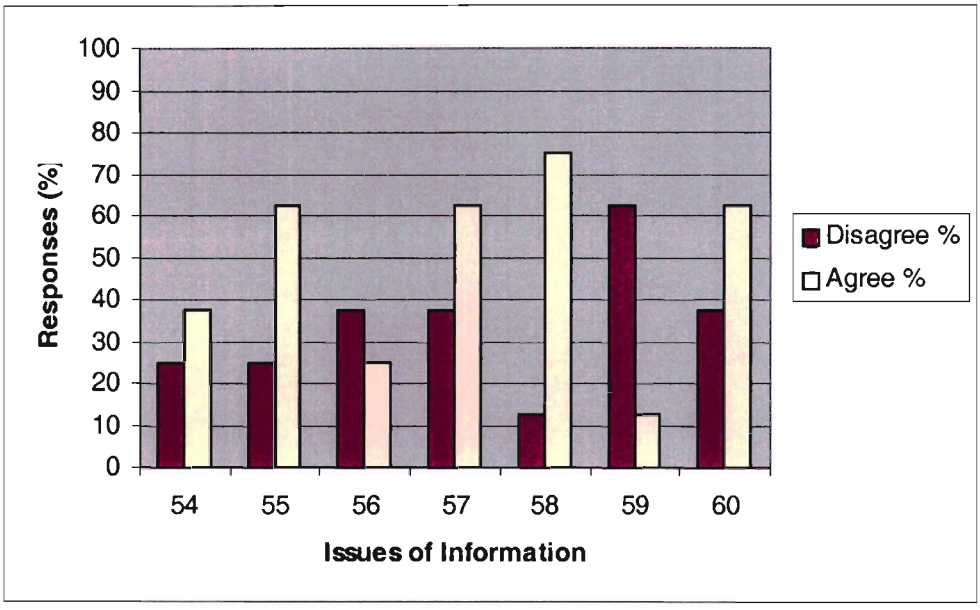
Research Question: Part A - Section Six (Questions 48 to Questions 53)

Research Objective: To investigate CMG's staff involved in the NPD process

Findings

- Respondents disagreed only for Questions 48, 49, 50 and 51
- Percentage of disagreement was highest for Question 50(75%) from the rest of the above Questions

5.10 Summarised Results of Section Seven of the Questionnaire: Information



Graph 5.8: Information

*Refer to Table 9 in Appendix 4 for computer tabulations
*Derived from Raw Data in Table 1 of Appendix 4

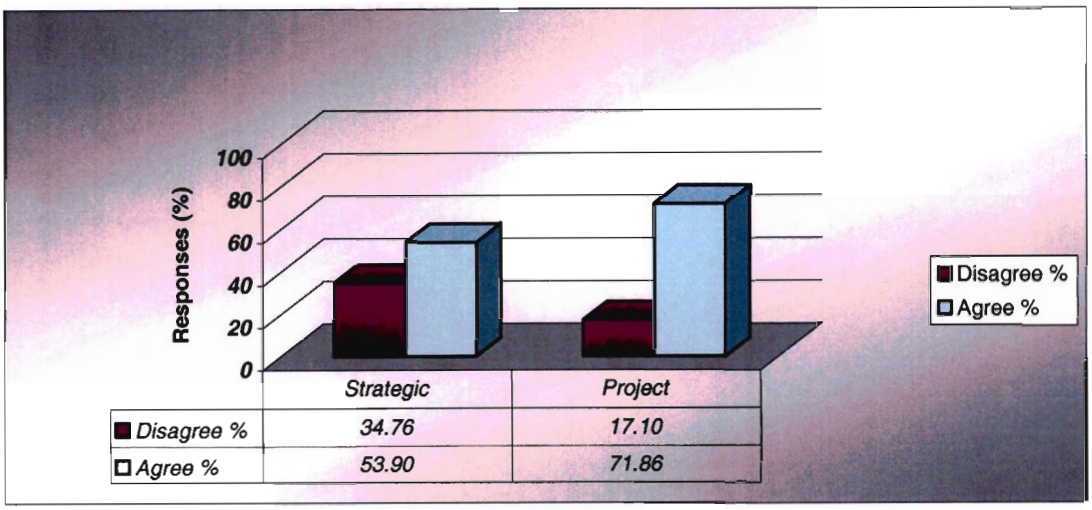
Research Question: Part A - Section Seven (Questions 54 to Questions 60)

Research Objective: To investigate CMG's information systems in relation to NPD

Findings:

- Respondents disagreed for Questions 56 (37,50%), 57 (37,50%), 59 (62,50%) and 60 (37,50%).
- The highest percentage of disagreement from the above 4 questions can be noted for Question 59.
- Highest frequency of Agreement was found for Question 58 (75%) in the above set.

5.11 Summarised Results of Relationship Between Strategic and Project Issues



Graph 5.9: Relationship Between Strategic and Project – Related Issues

*Refer to Table 11 in Appendix 4 for computer tabulations
*Derived from Raw Data in Table 10 of Appendix 4

Research Question: Part A - Sections One to Four (Strategic Factors) and Sections Five to Seven (Project Factors)

Research Objective: To explore the relationship between CMG's strategic management and project management.

Findings:

- A higher percentage of disagreement occurred for Strategic Factors (34,70%) compared to the lower percentage of disagreement for the Project-related factors(17,10%)
- A higher percentage of agreement occurred for both factors compared to the percentage of disagreement for the two parts.
- There was a higher percentage of agreement for Project-related factors (71.80%) than the percentage of agreement for the Strategic Factors (53%).

5.12 Conclusion

The above Bar Graphs and Charts were used because they helped represent the results as clearly as possible when responses are expressed in percentages. This choice of presentation was the most appropriate means of comparing the differences in the percentages of agreement and disagreement, thereby exposing the strengths and weakness in CMG's NPD Strategy. This will be discussed in the proceeding chapter, where meaning will be placed on the results obtained from the survey, in direct relation to CMG's NPD Strategy and Process.

CHAPTER 6 INTERPRETATION OF RESULTS

6.1 Introduction

This chapter is an interpretation of the results that was displayed in Chapter 5. The focus of this chapter is to give meaning to the figures and graphs that were represented in Chapter 5. The results will be put into perspective and once again, the analysis will be related to the research objectives as well as the literature, thereby achieving the aim of a detailed evaluation of CMG's NPD Strategy.

6.2 Interpretation of Chart 5.1 : Aggregate Response for All 60 Questions

The aim of Chart 5.1 was to show the percentages of the overall responses to all 60 questions. The high percentage of agreement reflected by Chart 5.1 indicates that respondents demonstrated a positive attitude towards most of the 60 questions. This means that CMG does possess majority of the key characteristics required for successful New Product Development as the model developed in Chapter 2 suggest (Refer to Table 2.1). Even though results show that respondents agreed (53%) to most of the questions, the 23% of disagreement cannot be ignored. This indicates that certain areas of CMG's NPD strategy are not efficient for success in the process. Neither can the very low percentage of responses (8%) for "strongly agree" be ignored. This is especially significant because it points out that, while the high percentage of agreement show CMG does have most of the characteristics for successful NPD, the low percentage of strongly agree implies that CMG's NPD strategy does not consider all of the essential issues required for NPD success. Therefore, Chart 5.1 is saying that CMG's NPD strategy needs to be reviewed if new

products are going to be developed with greater success. Performance levels can be improved if the issues that received a negative response are carefully considered when reviewing the NPD strategy.

6.3 Interpretation of Graph 5.1: The Relationship between the Seven Key Factors

Graph 5.1 also indicates that for all of the seven factors a higher percentage of agreement exists compared to the lower percentage of disagreement. Here again, it confirms that CMG's product group team members have a more positive attitude towards all seven factors of New Product Development, which mean that CMG's New Product Development Strategy includes the critical success factors. The differences in the percentage of disagreement and agreement for each of the seven factors displayed by Graph 5.1, however, gives some indication as to which of the seven factors are more problematic and which are not. Even though a higher level of positive attitude appears for the seven factors, the level of negative attitude should not be ignored. Graph 5.1 also shows the areas with the higher level of negativity compared to the ones with lower level of negativity. It is quite clear that the areas of concern for CMG's management are corporate strategy, role of management, culture, structure as well as information. This means that CMG should give particular attention to these factors that are critical for successful New Product Development. On the other hand, CMG's strengths lie mostly with the staff and the New Product Development Process, indicated by high levels of positive attitudes together with the lowest levels of negative attitudes toward these factors compared to the other factors.

This means that CMG should capitalise on these factors for successful New Product Development. Graphs 5.2 and 5.8 depict the seven factors individually so that insight into each of the 60 characteristics was gained. The seven factors were categorised according to Sections One to Seven of Part A of the Questionnaire (Refer to Appendix 1), which was based on the model of successful NPD (Refer to Table 2.1)

6.4 Interpretation of Graph 5.2: Corporate Strategic Issues

Graph 5.2 attempts to investigate the issues of corporate strategy at CMG required for successful New Product Development. The overall findings revealed that 60% of the respondents showed favourable attitudes towards corporate strategy while 28% indicated a negative response. (Refer to Graph 5.1) Graph 5.2 also reflects the strengths and weaknesses of CMG's corporate strategy in relation to New Product Development Strategy. A high percentage of agreement plus a low percentage of disagreement was denoted for each of the following questions:

- 5. High levels of synergy (i.e. the relationship between NPD and existing activities) exists within the company
- 9. The product strategy maximises company goals

This implies there are higher levels of positive attitudes towards these issues compared to the other issues of corporate strategy. Therefore the results show that CMG's strengths regarding corporate strategy lie in the above areas. CMG should take advantage of these two areas to maximise success in their NPD process.

Graph 5.2 also reflects high levels of negative attitude with low levels of positive attitude for questions 3 and 8, indicating that there are problems with these areas. Firstly, the results are exposing that CMG's corporate strategy restricts or stifles the creativity necessary for New Product Development success, while also revealing that CMG's corporate strategy is not aggressive. This implies that CMG's competitive strategies need to be more effective if NPD is to be successful. While the findings indicate that NPD is guided by the corporate strategy, it is important that the strategy is not so prescriptive as to restrict or stifle the creativity necessary for NPD success. Getting the balance right is not straightforward. (Baker & Hart, 1999:164) This is one of the challenges of NPD that CMG's management faces. However, results from the pilot study seem to contradict results from main study. From the results of pilot study, new ideas and creativity seem to be encouraged. (Refer to Questions 7 & 9 in Appendix 13)

6.5 Interpretation of Graph 5.3: The Role of Management

Graph 5.3 aims to investigate the managerial issues around the NPD process at CMG. The overall findings show no significant difference between the percentage of agreement and disagreement (See Graph 5.1). This indicates that there was as much negativity towards management issues as there was positivity. Therefore, while CMG's top management may have an important input into the NPD process, it cannot be concluded that CMG's management plays an effective role in ensuring New Product Development success. A closer look at the various issues of management

needs to be taken to understand why CMG's management is not effective, as it should be. Graph 5.3 reflects this.

A high percentage of disagreement was found for the following questions:

- 14. Management style is appropriate to the demands of product innovation
- 15. There are fewer layers of authority to speed the process of innovation

This implies that there are higher levels of negative attitude towards the above issues compared to the other management issues. Therefore the results show that CMG's weaknesses regarding the role of management lie in the above areas.

A higher percentage of disagreement (50%) compared to the percentage of agreement (25%) for Question 14 means that management style at CMG is not exactly appropriate to the demands of innovation. This means that highly directed and well-defined task definitions and communications systems exist, tasks are structured in a sequential rather than a parallel fashion and this could restrict free-ranging discussion and evaluation (West, 1992:142). This could be the result of corporate strategy stifling the creativity necessary for New Product Development as discovered in Graph 5.2. Corporate strategy defines the leadership style as well as the culture of the organisation. Corporate strategy at CMG could be preventing management from taking a different approach towards Product Innovation, one that is more participative. The results are indicating that high levels of negative attitude have occurred with management style as well as senior management commitment and this

can be related to the high levels of negative attitude towards corporate strategy and the restraints on creativity explained earlier. This could mean that corporate strategy is resulting in the problem of senior managers not being completely involved in the NPD process.

Graph 5.3 reflects the highest level of negative attitude with one of the lowest level of positive attitude towards question 15 in this section, thereby indicating a major problem with the hierarchical structure at CMG. The layers of authority at CMG may hinder the speed of innovation. (Refer to Appendix 7 for CMG's Organisation Structure) The study is implying that CMG may be characterised by, what the literature refers to as a classical management approach. This approach emphasises a structured, formal network of relationships among specialised positions in the organisation. (Bateman & Snell, 1999:593) This means that process and procedures are highly valued at CMG. Often the development effort is saddled with voluminous books of procedures, most of which typically have more to do with following the rules than they do with supporting innovative and successful products. Procedures should always support and encourage the desired result, which is ultimately, success and high performance products. (Bean & Radford, 2000: 82) The constraints imposed by this type of an approach can be deadly to new products.

Graph 5.3, however, indicate that for Question 11, levels of attitude appeared to be equal towards senior management's commitment and involvement at all stages of the NPD process. According to the model developed in Chapter 2 (Refer to Table 2.1),

New Product Development should be successful if senior management are committed and involved at all levels of the NPD Process. The findings reveal that senior management may not be completely involved in the NPD process, whereas the literature states that management styles that are essentially based on non-involvement will be poor resources for innovation management of any type. The majority of innovation studies reveal this as being crucial in creating the right climate for NPD (West, 1992: 143). Davies (1997:133) also supports this theory through findings that reveal, "where top management is involved in most issues, there is a higher likelihood of success."

6.6 Interpretation of Graph 5.4: Organisational Culture

Graph 5.4 aims to investigate the cultural issues around the NPD process at CMG.

The overall findings show that there was a higher percentage of agreement than the lower percentage of disagreement with issues related to organisational culture (Refer to Graph 5.1), meaning that respondents reflected a more positive attitude towards organisational culture. But, a closer look at the various issues of culture permits a more comprehensive interpretation of the specific areas of concern for CMG. This is reflected in Graph 5.4.

A high percentage of agreement plus the lowest percentage of disagreement in this section was denoted for the following questions:

- 20. Free-flow of information id encouraged between employees
- 23. High levels of shared values characterise the company culture
- 28. Suggestions are welcomed

This implies that there are higher levels of positive attitudes towards these issues compared to the other issues of organisational culture. Therefore the results show that CMG's efficacy, regarding the NPD strategy in relation to the company's corporate culture, is discovered in the above areas. CMG should use these areas to accentuate success in their NPD process.

A high percentage of disagreement was however found for the following questions:

- 18. Experimentation is encouraged
- 26. Considerable job mobility exists

This implies there are higher levels of negative attitude towards the above issues compared to the other cultural issues. Therefore the results show that CMG's weaknesses regarding organisational culture lie in the above areas.

The findings presented in Graph 5.4, indicate that experimentation is not encouraged at CMG (62% Disagreement). This aspect of culture can be related to the issue of creativity from the section on corporate strategy above. (Refer to Question 3 in Graph 5.2.) If experimentation is linked to creativity, the findings of the study verify that if creativity is stifled by the corporate strategy of CMG, then experimentation as a result

cannot be encouraged. This relationship reveals that organisational culture is defined by corporate strategy. If CMG's management intends to improve NPD success, then corporate strategy needs to allow for creativity to exist, in turn encouraging experimentation.

A higher percentage of disagreement compared to a lower percentage of agreement indicates that job mobility is not very flexible at CMG. Innovation depends on motivated employees who are willing to experiment and be creative and if a company does not allow for job mobility, then creativity may be restricted. This causes employees to get frustrated in their positions and eventually demotivates staff. The design of jobs, job rotation and career paths all have important effects on the creativity of managers and their employees. Jobs with substantial autonomy, variety and individual involvement offer intrinsic motivation to perform well. Jobs with low involvement as well as less autonomy and mobility cannot capture an employee's enthusiasm. Jobs with a considerable amount of mobility involve more of the individual and create greater internal drive for learning. (Hart, 1996: 459)

Graph 5.4, however, indicate that for Question 22, percentage of agreement appeared to be equal towards the issue 'positive internal attitudes existing between CMG staff members'. According to the model developed in Chapter 2 (Refer to Table 2.1.), New Product Development should be successful if positive attitudes prevailed. The findings reveal that some negativity also exists within the company. Thomas & Doak

(2000:17), in their report, state that "tensions in the workplace will have a negative impact on company performance" and eventually on the NPD process.

The corporate strategy as well as the leadership style in the company could affect a positive attitude amongst staff members. "It is surely a truism that the successful leader is one who gets things done through people. He/she spends his/her working day interfacing with people. The leader drives them, inspects them, excites them, liberates their potential, makes meaning for them, draws them around him/her, cares about them." (Ball & Asbury: 1989: 204)

The leader must take a deep interest in people. If they do not do this then they will not be able to build morale or build up enthusiasm. Thus, creating a negative sense of well being amongst staff members. Management needs to be committed to ensuring a positive atmosphere prevails throughout the company. "Leaders of super-performing companies take the time to tell people that their efforts were noted and appreciated and to tell them that they care. It shows that the company cares for their employees." (Ball & Asbury, 1989: 199)

6.7 Interpretation of Graph 5.5: Organisational Structure

Graph 5.5 attempts to investigate the issues around CMG's organisational structure that is necessary for successful New Product Development. The overall findings indicate that there were higher levels of positive attitude, as opposed to the lower levels of negative attitude, towards the organisational structure of the company.

(Refer to Graph 5.1) But, to make sense of why some of the responses were negative, a more detailed analysis of the structure of the company is required. Graph 5.5 reflects the strengths and weaknesses of CMG's organisational structure in relation to New Product Development Strategy.

A high percentage of disagreement was denoted for the following questions:

- 29.Organisational structure is free from rigid rules
- 35.Organisational structure is non-hierarchical

The results of the pilot study (Refer to Question 8 in Appendix 13) and the diagram of the organisation structure (Refer to Appendix 7) supports these results

The high levels of negative attitudes towards these issues compared to the other issues of the organisational structure, indicated by Graph 5.5, reveal the areas of great concern for CMG. However, for Question 7, there were no agreements, which means the structure of CMG's organisation is hierarchical, verifying the high level of negative responses to Question 15 on the layers of authority. This can be linked to Question 3 about the stifled creativity caused by the corporate strategy. This may be explained by the fact that corporate strategy defines the rigid and hierarchical structures of the organisation, which in turn is responsible for the many layers of authority thereby impacting negatively on creativity. Again it needs to be emphasised that structures need to be broken down and fewer layers of authority need to exist to speed up innovation processes. (West, 1992)

On the other hand, the higher percentage of agreement resulting for the other issues of organisation structure, presented by Graph 5.5, indicates that respondents are positive about the organisational structure especially in terms of co-ordination within the New Product Development projects team as well as face-to-face communication, and views being aired and considered. The results indicate that certain dimensions of CMG's organisational structure support New Product Development except in the areas of rigid rules and hierarchical structures.

6.8 Interpretation of Graph 5.6: The NPD Process

Graph 5.6 attempts to investigate the steps taken in the NPD process at CMG required for successful New Product Development. In Graph 5.1, the overall findings indicate that there was a very high level of positive attitude (77,78%), while a fairly low level of negative attitude(6,94%) towards the NPD process. This means that CMG is actually following most of the steps essential for NPD success.

CMG's NPD Process is referred to as the EPPIX Core Roadmap Process. (Refer to Appendix 11 for illustration on this process). This diagram on CMG's NPD Process shows that the company has the relevant steps needed for NPD success. Nevertheless, Graph 5.6 also reflects the few areas of weaknesses that are found in CMG's NPD process as follows:

- 41. The marketing strategy to be developed for the new product is cost-effective and affordable
- 45. The idea does not need to be sent back for product development

- 46. Management has the skills and time needed for NPD
- 47. The company has the financial resources required for NPD

Even though there were only a few negative responses to the above questions, these issues may have a considerable impact on NPD success if ignored. The problem could be in its early stages and could amount to a more crucial problem. Another important point to note is that all the steps in the NPD process, as stated by Kotler (1997) in the literature review in Chapter 2 must be followed to ensure the best chances of NPD success. If there are problems with any of the stages, this may have a negative impact on the other stages, thus affecting success of the product. The highest level of negativity occurred for the Question 46 relating to management's skills and time in the NPD process. Even though percentage of disagreement was significantly low (25%) for this question, compared to the issues from the other factors discussed, this issue could somewhat be related to the negative response for Question 11 in the section on the role of management. Question 11 refers to the issue of senior management not being committed and involved in the NPD process. The low level of commitment and involvement from senior management in the NPD process could be the result of the lack of skills as well as the consequence of management not having enough time for NPD, as indicated by the negative response in Question 46. This in turn could be related to the findings of Question 35 demonstrated by Graph 5.5 on the organisational structures. This means that the hierarchical structure may be preventing top management from having a 'hands-on'

approach in the NPD Process. The organisational structure could also be linked to the negative attitude towards job mobility, as illustrated in Question 26 of Graph 5.4 on organisational culture. Job mobility could be difficult for management especially because of the rigid organisational structure. This indicates why respondents feel that management style is inappropriate to the demands of product innovation. The analysis shows that the role of management is crucial for the NPD process and for NPD success. Even though the results indicate that the steps in the NPD Process are properly followed, the negative response of 25% from the product group reveals that there is a problem at a strategic level and not really at the project level.

A minor problem is indicated with the finance in the company, as indicated by the low percentage of disagreement towards Questions 41 and 47 in Graph 5.6. These two issues are related, since the results point to a problem with the marketing strategy not being cost-effective and affordable which could mean that the real problem lies with the company not having enough financial resources to support this step in the NPD Process. It should be emphasised that all of the steps highlighted by the model on NPD success in Table 2.1, are very important if new products are to be successful (Kotler, 1997). Baker & Hart(1999:466) share the same view as Kotler,(1997), that there is a greater probability of success if all the steps in the process are completed.

6.9 Interpretation of Graph 5.7: Staff

Graph 5.7 attempts to investigate the staff issues related to the NPD process at CMG. The overall findings indicate that there was a predominantly high level of positive attitude (89,58%) towards the issues of staff while a fairly low level of negative attitude (10,42%)(Refer to Graph 5.1). This means that there is an integration of tasks amongst project team members in the NPD process, which is the desired result if NPD is to be carried out successfully.

However, there are a few areas of concern with the staff issues as well. Negative responses were identified for the following questions:

- 48. Functional co-ordination is identified as a critical factor contributing to the development of the new product
- 49. Cross-functional skills are highly valued in the company
- 50. Team members work together from start to finish during the NPD process
- 51. Team members feel responsible for and is able to work on any aspect of the NPD project

Even though the level of negativity was not significantly high (25%) for Question 50, it is identified as the main area of concern. The problem here is not that the team members do not work together at all. Saying this would contradict the findings that there is an integration of tasks, but there seems to be a difficulty in the team members working together "from start to finish during the NPD process." This indicates that the NPD team members do work together but not at all the stages of the NPD

Process. The reason for this could again be a result of the rigid structures of the company, which may also restrict staff and even management from being involved in all the levels of the NPD Process. From the data collected in the pilot study it is clear that the company has specific people responsible for specific functions. Functions seem to be strictly defined allowing for very little job mobility. (Refer to Questions 5 & 8 in Appendix 13)

But positive attitudes may prevail because, while functions are highly defined, there is still a close relationship existing between the different departments. This is indicated by a 100% agreement for Question 52 in Graph 5.7. The results also indicate a 100% agreement for Question 51 regarding teams being multi-skilled. This means that team members are extremely positive about these two issues. These findings mean that at certain points in the NPD Process there is an overlap of functions with team members at CMG.

6.10 Interpretation of Graph 5.8: Information

The objective of Graph 5.8 was to investigate the issues relating to information in CMG's NPD Strategy. The overall findings indicate that product group members have a more positive attitude (48,21%) towards information rather than negative attitudes (33,93%). (Refer to Graph 5.1) But there is not a great difference; therefore this reflects that there *are* problems that exist with information in the NPD Process at CMG. The results are saying that the way in which information is managed at CMG is not effective as it should be.

The weaknesses with CMG's NPD strategy regarding information have been identified in the following areas:

- 56. Technical and marketing information are both accurate and timely in the NPD process
- 57. Information is constantly reworked at in the light of the changing circumstances during the NPD process
- 59. Centralised data bases are available for supporting NPD within the company
- 60. Networking of information speeds communications and cuts costs during the NPD process

The main concern from the above issues is that centralised databases are not available for supporting NPD within the company. This was indicated by a very high level of negative attitude together with a very low level of positive attitude, implying that the problem is quite serious. Centralised databases are essential for CMG if staff is to be able to feed the centre with new ideas for product development and for the centre to be able to keep the periphery informed of the changes in the environment that might supply new opportunities. The centre that is mentioned here refers to what CMG refer to as the Market Requirements Database. (Refer to Appendix 11) However, the study is revealing that this information system is not efficient enough or it may be a case of the database not being accessible to all team members thereby reflecting a problem in the NPD Strategy.

Centralised databases are important in resolving problems by giving valuable support to NPD. They can also substantially improve the available resources to bring product concepts rapidly from the idea stage into the screening process. (West, 1992:132) Information, therefore, is the base currency of the NPD process, evaluative information is crucial and must be efficiently disseminated to facilitate communication.

The results also show a high level of negativity around networking of information. This is verifying that information is not accessible enough to speed up communication and cut down costs in the NPD Process and could result from the lack of an efficient centralised database as indicated above. The lack of information about technology and market knowledge, especially in the telecommunications industry, could cause resistance to change or innovation thereby affecting NPD success. (Rothberg, 1981:400) Bruce & Biemens (1995:32) support this by stating that "information plays a role in facilitating an efficient NPD Process and achieving functional co-ordination", a point also noted for the staff-related issues. The notion of uncertainty as the main objective of project development activities is reiterated throughout the literature (Hart, 1996). Thus, project activities can be considered as discrete information processing activities aimed at reducing uncertainty.

6.11 Interpretation of Graph 5.9: Relationship between Strategic and Project Issues

The aim of Graph 5.9 was to investigate the relationship between the strategic management issues and project- or task-related issues. Strategic issues include the factors: corporate strategy, role of management, organisational culture and organisational structure, while project issues include the factors: the NPD process, staff involved in the process as well as information. The results indicate that overall there is a higher level of negative responses (34,76%) for strategic issues compared to a fairly low level of negative (17,10%) responses for the project-related factors. This means that respondents showed a greater negativity towards strategic management issues than for the project issues. This reflects a major problem with the strategic factors at CMG rather than the project factors. Thus, indicating an unhealthy situation for CMG, because inevitably problems with strategic issues will impact negatively on the NPD projects. From the individual analysis of the key factors, it was also quite evident that there are more areas of concern with the strategic issues than with the project-related issues. It was also noted in the individual discussion of the seven factors, that certain problems with the strategic issues could be accountable for problems with the project-related issues.

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The following relationships have been identified by the results:

- The problems with senior management commitment and involvement (strategic level) would be the reason for management not having the skills and time for the NPD Process (project level).
- Inappropriate management style (strategic) could be the result of the company not having a centralised database (project level). Management's style could be determined by the company structure (strategic), which in turn may be preventing senior managers from communicating information to the project team members and this could be the root cause of high costs during the NPD Process (project).
- The corporate strategy that is stifling creativity (strategic) may be why team members are restricted to work only on designated steps in the NPD project and not work together from start to finish (project).
- Rigid and hierarchical organisational structures (strategic) may be the outcome of top management not getting involved in the NPD process and therefore negative attitudes were revealed for management not having the skills and the time required for NPD success (project).
- Organisational structure (strategic) may also be the consequence of team members not working together from start to finish, in the sense that the rigid structure restricts or confines them to undertake tasks specifically allocated to them (project).

Therefore, this means that if CMG has to improve performance within the NPD process, they need to give considerable attention to the strategic management factors, especially role of management and organisation structure.

On the other hand, the findings indicate no significant difference between the positive attitudes towards both of the strategic and project factors. However, a higher level of positive attitude was revealed for both these issues, than were revealed for the levels of negative attitudes. This could only mean that CMG does have most of the key characteristics of a leading innovator but by looking at the factors one by one in detail, the strengths and weaknesses of CMG's NPD strategy were identified. However minor the problems might appear, there is always room for improvement.

CHAPTER 7 RECOMMENDATIONS

7.1 Introduction

The purpose of this chapter is to recommend solutions to the problems identified in Chapter 6 on the interpretation of the results. Recommendations will be made for each of the problem areas under the appropriate key factors as they appeared in Chapter 6. It should be noted that these problems overlap and are evidently linked to each other, as explained in Chapter 6. Therefore, suggestions coalesce with each other.

Recommendations will also be made for the issues concerning the relationship between the strategic management factors and the project-related factors. It should also be noted that these are only recommendations and suggestions that *may* be used for successful New Product Development. Some of the recommendations may apply to CMG while others may not, depending on management's approach to the problems. CMG may already be following some of the pointers for successful NPD mentioned in this Chapter, in which case, CMG should attempt improving on these areas. Therefore, the decision of choosing the most appropriate way to overcome the obstacles to a successful NPD strategy is management's.

7.2 Corporate Strategy

7.2.1 Creativity

What can CMG's management do to foster creativity within an individual and on the part of the organisation? According to Rothberg (1981), in his book entitled, "Corporate Strategy and Product Innovation", four ways to maximise creativity are mentioned: It is recommended that CMG use these methods to improve the problem of creativity being stifled by the corporate strategy.

- **Value and Rewards:** CMG should in fact prize and reward creativity. Corporate strategy should stress creativity as an organisational goal that encourages and expects it at all levels. This will increase the chance of product innovation success. But, it is one thing to call for creativity, another to mean it, and still another to reward it adequately and consistently when it occurs. More specifically, creativity as a value should find expression in compensation, freedom and communication.
- **Compensation:** In most areas of day-to-day functioning, productivity rather than creativity is and should be the principle objective; thus, general reward policies tend to measure and stress regular output. But, even where creativity is truly desired and encouraged in good faith, activities that are potentially more creative may be subordinated to those more visibly and closely tied to reward policies. CMG needs to very aware of this. Where creativity and not productivity is in fact the goal, then creativity and not productivity should in fact be measured and rewarded. If creativity is hard to measure and takes longer periods to assess,

then this probably requires some speculative investment on the part of CMG if they want to keep and nurture the few employees and the few activities that will eventually be worth it. If CMG wants to foster creativity, instead of impeding it, by material incentives, a different yardstick will have to be applied.

- **Freedom:** Creativity can be increased at CMG if creators are given the freedom in choice of problem and method of pursuit. Greater freedom is necessary to maximise those satisfactions that are important to the innovator. But such freedom may put the appropriate objectives of CMG at odds with the demands of maximum creativity. This, however, is one of the risks that CMG has to be prepared for in the nurture of creativity. But, at the same time a company cannot encourage creativity without a certain element of risk involved.
- **Communication:** Free and open channels of communication should exist at CMG, both vertical and horizontal. Potential creators need and seek relevant information whatever its source, within or without the organisation. Ideas wither for lack of a grapevine. A possible approach or even a well worked-out solution must be communicated to those with the power to evaluate, authorise, and implement. The presence of formal channels is not enough. Employees must feel free to use them, and channels must not be clogged by routine paperflow that ties up time with "programmed trivia," and creates an air of apathy and neglect towards incoming messages because it is so unlikely that they will contain anything of value. (Rothberg, 1981:307)

7.2.2 Aggressive Competitive Strategy

CMG needs to turn to a much more aggressive approach against competitors in the market. Aggressive strategies that are derived to capitalise on market opportunities should be used. Product development projects should be technologically aggressive, especially for companies active in the telecommunications market. New product development needs to be reviewed as being the more important means of growing the business, and new product strategies need to be integrated into the formal planning process. (Davies, 1997)

However, if CMG has to use this approach, it is important to begin by monitoring competitive activity of competitors on a regular basis. Although total defeat may be appropriate as a military objective, it is rarely relevant in business. New market equilibrium may be much more profitable, involving stable market shares, no price wars and viable levels of profitability. Some competitors may be naturally more aggressive than others and have more substantial resources. If it is possible to choose, then these may be the competitors that CMG should avoid when planning an aggressive approach. Choosing an enemy that can provide a successful outcome is important. Attacking the market leader is not usually wise. (Lynch, 1997:178)

There are also other innovatory strategies that may prove particularly significant to CMG. These include rewriting the rules of the game, technological innovation, higher levels of service and partnerships. (Lynch, 1997:177)

- **Rewriting the rules of the game:** In competitive strategy, the existing players in the market will work according to a mutual understanding of how competitors are engaged - the rules of the game. Rewriting the rules of the game is important in corporate strategy.
- **Technological Innovation:** It may be essential for CMG to introduce some form of innovation in order to take market share. This does not mean that this is the only way to enter a market and survive, but it may represent a viable route.
- **Higher Levels of Services:** Even though technology is the dominant feature in the telecommunications industry, service levels are still very important. It is evident from the SWOT analysis in Appendix 6 that CMG is making an effort to keep service levels at its highest. The company's mission statement (See Appendix 8) as well as their objectives regarding customers and services (See Appendix 9) reflects this as well. For CMG it is vital to incorporate customer services with technological innovation for successful New Product Development.
- **Partnership:** Formal partnerships or some other form of joint activity have proved useful innovatory strategies. Ventures, alliances or acquisitions have been used with success to beat larger rivals. CMG has used acquisition as a means to be more innovative. Refer to Chapter 3 for details on the acquisition process. In CMG's newsletter, Telecommit (Sept 2000), the following comment was made by

Wim Rimmelzaan, President of CMG Telecommuniactions about the acquisition of Computer Answers by CMG: "We have been looking for ways to extend our product portfolio with a billing system. Our customers are increasingly experiencing difficulties with their current CC&B Systems when charging for the advanced information services CMG enables them to offer. We have found the EPPIX product from Computer Answers, installed in over 20 countries world-wide, an excellent platform for a powerful billing solution. EPPIX will allow operators to charge for network usage for pre and post paid subscribers based on connection time, data volume and information content. Furthermore, there is little overlap in our respective customer bases which creates ample opportunity to provide them with greater added value through an increased product portfolio." Through the acquisition, technological capabilities were put together to produce an even more competitive product in the industry. This was an enormous opportunity for the company in terms of NPD.

7.3 The Role of Management

7.3.1 Commitment from Top Management

According to Johne & Snelson (1990) in an article edited by Hart(1996), top management needs to be more intimately involved, often on a day-to-day basis. But at CMG, the product development process is not completely new, as in a 'new-to-the-world' product, but only an improved product that is a development of existing products (Seres, 1978:11). Therefore, top management at CMG could very well be supportive but may not meddle in the development projects.

In the case of important and expensive new product developments, top management should get involved especially closely in checking progress. There should be no question of top management distancing themselves from the consequences of key decisions. (Hart,1996:52)

7.3.2 Management Style

Democratic management styles are most appropriate for those companies involved in the introduction of fundamental research or those companies, like CMG, that are heavily dependent on the market for innovative concepts. (West, 1992:142) Therefore, management style at CMG should be democratic. By democratic it is meant that:

- The organisation should be undirected in the way in which they approach tasks and communicate with other members of the project team.
- There should be a continuous revision and reappraisal of products and processes.
- Channels of communication should be open.
- Diversity of opinion and the involvement of non-specialists in problem solving should be accepted. (Rothberg, 1981)

7.3.3 Layers of Authority

Increased layers of management may cause a tendency for more senior staff at CMG to become more and more divorced from the reality of the marketplace, as they give their time to supervision and internal meetings. As a result, the decisions may often be taken on inadequate understanding of what is currently occurring in an often rapidly changing demand pattern. The multi-layered management structure can also lead to the pursuit of status rather than achievement. In other words the management team will be more interested in how a particular proposal might affect their status within the firm rather than the effect of the proposal on the wellbeing of the organisation. This means that any entrepreneurial direction will tend to be squashed rather than fostered because of the high level of risk that new directions entail and the damage that this can cause for the status of the individual. (West, 1992:122)

Excessive layering kills ideas before they even get considered by senior managers. Barriers fencing off R&D, marketing, production, and finance bottle up functional problems until its too late for effective solutions. Elaborate approval systems grind promising innovations to a halt. "Staff nit-pick ideas or put financial yardsticks on them long before they are mature enough to stand rigorous scrutiny" (Pearson, 1991:11).

7.4 Organisational Culture

7.4.1 Experimentation

If CMG's management intends to improve NPD success, then corporate strategy needs to allow for creativity to exist, in turn encouraging experimentation. Experimentation is an important part of the product development process. At the strategic level, a commitment to experimentation early in the process will identify product concepts that should not be allowed to go forward into design. If executive management at CMG insist on appropriate experimentation and commits to acting according to the results of the experiments, the company will conserve resources and save the financial and time costs associated with failed products. (Bean & Radford, 2000:162)

To improve innovation through encouraging experimentation, CMG needs to build on a performance-based culture. Probably the most fundamental attribute shared by innovation champions is their commitment to performance. Several of the super-performers were consciously trying to build or enhance performance-based cultures in their organisations. (Ball & Asbury, 1989: 114)

7.4.2 Job Mobility

Careers play an important role for individuals. Individuals who spend an entire career in a single functional or product area will be more narrowly focused or less innovative than their colleagues with broader career experiences. This experience can only be gained if the company culture allows for job mobility. "Employees with

experience in multiple areas and functions will have a more balanced view of the organisation's strengths and weaknesses and a broader set of contacts from which they can learn. When this is effectively implemented innovation can be encouraged" (Hart, 1996:450).

Though an organisational structure and culture that discourages job diversity can inhibit innovation, it is also true that a human resource system that produces too many promotions, and too quickly can have the same effect. If CMG lead their employees to expect a promotion every two years, this will only encourage short time frames. Innovation and change take time; individuals must expect to stay in jobs long enough to influence both short and long term performance indicators. Thus, career-planning systems must find the right balance between the complacency bred by narrow career mobility, and the short run mentality of job-hopping.

Creative people need personal motivation. CMG's management could do several things to get this. Firstly, they need to recognise that innovators are apt to be different and need special treatment. Innovators cannot be allowed to violate rules at will, but management need to recognise individuality, be tolerant of some aberrations, and be supportive of stress. Secondly, management needs to allow innovators freedom to associate with others in similar positions. This freedom extends to all functional areas and to outside the firm as well. Thirdly, management should permit innovators to help select projects for development, though this is often difficult. Fourthly, CMG's management should recognise achievement. Creative people are usually unimpressed

by group rewards. They believe group contributions are never equal, especially if the group is company employees, for many of whom creative individuals have great disdain. Fifthly, job assignments should be challenging. Creative people don't lack confidence and, in fact, often consider their current projects a waste of time. This means they will determine whether a project is worthy (Crawford,1991:88)

7.4.3 Attitudes of Staff Members

Linked to the attitude of staff members is the vision of the company, which is an issue of corporate strategy as well. Having a vision is one thing, but turning it into something that has meaning, something people can put their arms around and cling to is quiet another. This is about making meaning, and language is the currency. The leaders of CMG must define the culture and act as custodians of that culture (Ball & Asbury, 1989:197).

By understanding the corporate culture and by getting everyone on board with that culture, CMG's leaders can ensure that the basis of the organisations value system is formed. This is the one thing organisational members identify with - "culture" - and this is the one thing that will ensure a sense of belonging and hence create a positive attitude.

There are two attitudinal prerequisites for successful product innovation: CMG's top management must be open to new ideas and suggestions and CMG's sub-ordinates must be motivated to make new product proposals and see them through to successful

conclusions. Objectivity, confidence and enthusiasm all are vital elements of this process. Many companies are so obsessed with improving the efficiencies of their current operations that they create an atmosphere in which product innovation is impossible. They are excessively preoccupied with short-term financial performance. They avoid financial commitments with intermediate or long-term pay-off potentials. These companies structure their incentives to encourage short-term accomplishments. Their patience with new product projects is short and they try to eliminate potential failures as rapidly as possible. Top management may give lip service to innovation in these situations, but company policies create an atmosphere in which subordinates find it more in their interest to avoid failure rather than to pursue success. Whatever new products are developed in this environment tends to be relatively certain of success and also relatively small contributors to corporate profits. This situation should be avoided at CMG at all costs. (Rothberg, 1981:13)

Finally, it is crucial that CMG's organisational environment foster attitudes of objectivity, confidence and enthusiasm on the part of individuals charged with implementation of the product innovation effort.

7.5 Organisational Structure

The problems with CMG's organisational structure could cause the following constraints, as indicated by Quinn (1991:20) in his article, "Managing Innovation: Controlled Chaos":

- **Top Management Isolation:** Many senior executives have little contact with conditions in the production department or with customers who might influence their thinking about technological innovation. Since risk perception is inversely related to familiarity and experience, financially-oriented top managers are more likely to perceive technological innovations as more problematic than acquisitions that may be just as risky, but that will appear more familiar.
- **Short Time Horizons:** The perceived corporate need to report a continuous stream of quarterly profits conflicts with the long time spans, that major innovations normally require. Such pressures often make companies favour quick marketing fixes, cost-cutting and acquisition strategies over process, product, quality innovations that would yield much more in the long run.
- **Excessive Rationalism:** Managers often seek orderly advance through early market research studies. Rather than managing the inevitable chaos of innovation productively, these managers soon drive out the very things that lead to innovation in order to prove their announced plans.
- **Excessive Bureaucracy:** In the name of efficiency, bureaucratic structures require many approvals and cause delays at every turn. Experiments may take

days or weeks. The interactive feedback that fosters innovation is lost, important time windows can be missed, and real costs and risks rise for the corporation

CMG's managers need to think carefully about how innovation fits into the company strategy and structure, their technological skills, resources as well as organisational commitments accordingly.

7.6 The NPD Process

The challenges that CMG faces in regards to their NPD Process can be resolved if the following guidelines for the problematic stages in the process are taken into consideration as outlined by Kotler (1997).

7.6.1 Marketing Strategy Development

After the stage of concept development and testing, the new-product manager must develop a preliminary marketing strategy plan for introducing the new product into the market. The marketing strategy will undergo further refinement in subsequent stages. The marketing strategy plan should consist of three parts:

- The first part should describe the target market's size, structure, and behaviour; the planned product positioning; and the sales, market share, and profit goals, sought in the first few years.
- The second part of the marketing strategy should outline the product's planned price, distribution strategy, and marketing budget for the first year. This part of

the marketing strategy development stage is where the results revealed a problem, therefore CMG needs to review this section of their new product strategy.

- The third part of the marketing strategy plan should describe the long-run sales and profit goals and marketing mix strategy over time

7.6.2 Business Analysis

The problem identified from the results about the company's financial resources required for the development of a new product, is actually an issue of the business analysis stage of the NPD process. This is the stage that should follow after the marketing strategy development stage. After CMG's product managers develop the product concept and marketing strategy, the proposal's business attractiveness must be evaluated. Management needs to prepare sales, cost, and profit projections to determine whether they satisfy the company's objectives. If they do, the product concept can move to the product-development stage. As new information comes in, the business analysis will undergo revision and expansion. The following two cost estimates are vital in CMG's NPD plan:

- **Estimating Total Costs**: Management needs to estimate whether sales will be high enough to yield a satisfactory profit.
- **Estimating Costs and Profits**: After preparing the sales forecast, CMG's management should estimate the expected costs and profits. R&D, production, marketing and finance departments of the company estimate the costs.

In Appendix 12 on the Core Roadmap Process illustrating the Business Plan for NPD, this step fits under the item "costs" in the business plan. This shows that the company does follow the step in the process but at the same time, this part of the business plan needs to be given more attention as indicated by the negative response regarding finance in the NPD process.

7.6.3 Product Development

If the product concept passes the business test, it moves to R&D, and/or designing to be developed into a physical product. Up to this point the product concept should only have existed as a word description, or a prototype. This step calls for a large jump in investment that dwarfs the idea-evaluation costs incurred in the earlier stages. At this stage CMG should determine whether the product idea could be translated into a technically or commercially feasible product. If it cannot, then CMG's accumulated project cost may be lost except for any useful information gained in the process.

The R&D department should develop one or more physical versions of the product concept. Its goal has to be to find a prototype that the customers who are the network operators, see as embodying the key attributes described in the product-concept statement, that performs safely under normal use and conditions, and that can be produced within the budgeted production costs.

If the above steps are followed properly, then CMG should have a marketing strategy that is cost-effective and affordable, the financial resources that will be needed in the later stages of the NPD should be available, and the idea will not have to be sent back for product development

7.6.4 Management Time and Skills

For the issue of management not having the appropriate skills and adequate time for the NPD process, reference should be made to 7.2 which focuses on the role of management as well as 7.6 below on staff, because this primarily is the underlying problem. Suggestions for these two factors should help resolve this particular management issue.

7.7 Staff

7.7.1 Functional Co-ordination

Functional co-ordination is the underlying problem with the various issues discussed in Chapter 6. The negativity around the Questions on staff all relates to this one problem. Therefore, since there is a close relationship, the recommendation is basically one and the same.

CMG should concentrate on building cross-functional skills. People cannot improve the NPD process without the necessary skills. If CMG wants to be a high-performing company, management need to emphasise a set of skills notably different from their successful counterparts. They must value cross-functional skills, instead of functional strengths. As an example, high performers boast, "We've got the best project managers in the world." Low performers say, "We've got the best systems engineers." (Nevens, Summe & Uttal, 1991: 67)

Building excellent cross-functional skills is a challenge that CMG's management faces, especially because structures and habits work against them. People identify with their profession and usually want to get better at what they do. And most day-to-day work is function specific. CMG can use two ways to enable cross-functionality:

- Training can go a long way in blurring functional lines and easing co-ordination
- Job rotation is another way to cross-train. (Nevens, Summe & Uttal, 1991: 67)

Another approach to solving the problem of functional co-ordination is the holistic or "rugby" approach (Takeuchi & Nonaka, 1991: 57). The new emphasis on speed and flexibility in the telecommunications market calls for a different approach for managing new product development by CMG's management. The "rugby" approach - where a team tries to go the distance as a unit, passing the ball back and forth - may better serve today's competitive requirements.

Under the rugby approach, the product development process emerges from the constant interaction of a handpicked, multidisciplinary team whose members work together from start to finish. Rather than moving in defined, highly structured stages, the process is born out of the team members' interplay. This approach is essential if CMG seeks to develop new products quickly and flexibly. The shift from a linear to an integrated approach encourages trial and error and challenges the status quo. It stimulates new kinds of learning and thinking within the organisation at different levels and functions. Just as important, this strategy for development can act as an agent of change for CMG. The energy and motivation that the effort produces can spread throughout the company and begin to break down some of the rigidities that may have set over time.

7.8 Information

Today's environment tends to be complex, dynamic and therefore uncertain. Huge amounts of information flow from the external environment to the organisation and back to the environment. To cope, CMG must acquire, process and respond to that information. Doing so has direct implications for how CMG should organise. To function effectively, CMG needs to improve structures for processing information. A general strategy that can help CMG's management to cope with high uncertainty and heavy information demands is that management can increase its capacity to handle more information.

CMG may take the approach of increasing its information processing capability. They can invest in information systems, which usually means employing or expanding computer systems. They create horizontal relationships to foster co-ordination across different units. Such horizontal relationships are effective because they increase integration, which is necessary for managing complex environments. As uncertainty increases the following horizontal processes may be used, as suggested by Bateman and Snell (1999:310) ranging from the simplest to the most complex.

- Direct contact among managers who share a problem.
- Liaison roles, or specialised jobs to handle communication between departments.
- Task forces, or groups of representatives from different departments, brought together temporarily to solve a common problem.
- Teams, or permanent inter-departmental decision-making groups.

- Product or project managers who direct inter-disciplinary groups with a common task to perform.

The following could be possible causes of information problems for CMG, as identified by Rothberg (1981) in his book "Corporate Strategy and Innovation":

- Too many people being involved in a transfer.
- Physical decentralisation of research facilities.
- Lack of special skills and knowledge to cope with new markets and technologies.
- Operating staffs failure to understand language and utility of basic research.
- The unwillingness or inability of research staff to communicate their ideas in terms that operating staff can understand.
- The sheer complexity of the market or a new technology.
- The cost of getting the information about a market.

Some of these may be beyond the control of CMG's management, but more often information restraints appear simply because management have provided neither the systems necessary to generate required information nor the procedures to effectively bring this information before the right people (Rothberg, 1981:400).

7.9 The Relationship between the Strategic and Project-Related Issues

The negative attitudes in this study are extremely important for evaluating the company's NPD strategy and for making recommendations on which area to improve on. The positive attitudes tell the company where to capitalise by using their resources to the best of their ability. If they cannot improve on the problematic areas, rather focus on what they do best. But, at the same time, keeping in mind that all the characteristics are closely related, therefore critical. A weakness in one area will impact on another area.

The implications of this crucial relationship between strategic and project-related issues, for CMG's management means, that there may be a need to acclimatise its strategy with every new product development project. The requirements and needs for the development of one product may be different from another product. CMG needs to learn how to adapt their NPD strategy with the changing requirements of the external environment, especially the customers and technological markets.

CHAPTER 8 CONCLUSION

8.1 Summary

Management practices at CMG should reflect the realities of the NPD or Innovation process for it to be successful. Innovation tends to be individually motivated, opportunistic, customer responsive, tumultuous, non-linear and interactive in its development. CMG's managers can plan overall directions and goals, but surprises are likely to abound. Consequently, the company should keep their programs flexible for as long as possible and freeze plans only when necessary for strategic purposes such as timing. Even then CMG should keep options open by specifying broad performance goals and allowing different technical approaches to compete for as long as possible.

CMG executives need to understand and accept the tumultuous nature of innovation, learn from experiences of super-performing companies, and adapt the most relevant features of these companies to their own management practices and cultures. As the results of this research study indicate, CMG does have the ability to be a leading innovator if their weaknesses in their NPD strategy are overcome. The company can innovate to meet the severe demands of global competition by top management's commitment to the NPD process, a genuine NPD strategy, a flexible entrepreneurial atmosphere, proper incentives for innovative champions and an effective information management system.

To sum up, it is believed by Pearson (1991), that the following steps can be taken to make the company more dynamic and innovative.

- Create a corporate environment that puts constant pressure on everyone to beat the company's specific competitors at innovation. In other words incorporate an aggressive strategy.
- Structure the organisation so that innovation is promoted instead of thwarting it.
- Develop a realistic strategic focus to channel innovative efforts, know where to look for good ideas and how to use the business system to leverage them once they are found.

It all sounds simple because, of course, it is. Simple, but not easy since each NPD project is a constant challenge from beginning to end. Yet innovation is the challenge CMG has to meet because that is what builds market leadership and competitive momentum. That's the bottom line. And that's why it is worth the extra effort to become an innovative company.

8.2 Suggestions for further research

This research report raises a number of areas that could be further explored:

- The external factors of successful new product development such as market and technology, competitiveness and customer satisfaction can be further investigated.
- The performance measures of successful new product development can also be researched from a financial perspective of the new product.
- The reasons for new product failure are other areas that can be examined. The impact of this study can prevent the company from repeating the mistakes made with previous product development failures.
- The role of strategic alliances or mergers and acquisitions on product innovation is another interesting dimension that can be studied

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GLOSSARY OF TERMS

Term	Meaning
CCBS	**Customer Care Billing System**. A software system used to collect, process and distribute data received by a GSM system for example, EPPIX
GSM	**Global System for Mobile Communications**. The original meaning was **Groupe Spécial Mobile**. Digital mobile telephone system according to European standard in the frequency ranges 900 and 1800MHz. Also implemented on 1900MHz in US.
NO	**Network Operator.** For example, MTN, Vodacom, CellC
Post Paid Subscriber	A subscriber who is given credit by the network operator and allowed access to the mobile network. Payment is made on a weekly, monthly or yearly basis for consumption
Prepaid Subscriber	A subscriber who pays for network usage upfront before being allowed access to the mobile network
Subscriber	A mobile phone user on the GSM Network. Several subscribers can be held in a single customer account. For example, a company may give mobile phones to its staff, in which case the company is the customer and the staff are individual subscribers.

APPENDIX 1 : Main Study - Introduction Letter and Questionnaire

UNIVERSITY OF NATAL, DURBAN

DURBAN CAMPUS

GRADUATE SCHOOL OF BUSINESS

Friday, June 07, 2002

Dear Sir/Madam

MBA RESEARCH QUESTIONNAIRE

I am currently completing my MBA Dissertation at the University of Natal, Durban, South Africa. The title of my research is An Evaluation of A Telecommunications Solution Provider's New Product Development Strategy.

Your company has been selected for evaluation. Product Development of the EPPIX Customer Care & Billing System (EPPIX CCBS) will be investigated. The EPPIX CCBS is the "New Product" that I will be referring to in my study. According to academics in the field of New Product Development, the EPPIX CCBS is classified, in terms of its newness to the company and to the marketplace, as a product that provides improved performance or greater perceived value and replaces existing products with the later version (Booz, Allen & Hamilton). In this sense, CMG's product is a "new product". It is an improved product that is a development of existing products representing a meaningful alteration. The objective of my study is to identify whether CMG has the key characteristics of a leading innovator by investigating the factors influencing New Product Development success.

Your input will be of significant value to the existing body of knowledge in the field of New Product Development or otherwise termed Product Innovation. As you might know, the lifeblood of our organisations is the ability to satisfy the changing needs of our customers through the introduction of new products or product innovation. It is in this context that it can be said that product innovation is essential to corporate survival and growth.

Please take note that individual results of this questionnaire are completely anonymous. Only aggregate data will be used to express results of the study. All information on your company gained from this study will remain confidential in accordance with the confidentiality agreement between the University of Natal and CMG-Wireless.

Your complete honesty in answering the questions will ensure the most accurate results. It is an evaluation of *your company* and will be most beneficial if responses to the questions reflect a true image of your company in relation to New Product Development.

In appreciation for your co-operation I would gladly forward for your attention and interest an executive summary at your request. The company will also receive a copy of my dissertation. The summary will provide an indication of the New Product Development Strategy that may be applied to increase chances of success.

Unfortunately, time has run out on this project and to enable me to complete this research, a swift response is needed from you. It would be appreciated if the questionnaire could be completed electronically. Once completed, please e-mail to teenag@webmail.co.za by the 11th June 2002. Should you have any questions whatsoever, I can be contacted on +27 83 782 2555 or the above e-mail address.

Thank you for your help and valuable time.

T.Gengan
Mobile : +27 (0) 83 782 2555
Landline : +27 (0) 11-8031076
E-Mail : teenag@webmail.co.za

PART A: QUESTIONNAIRE

Study of Factors influencing New Product Development (NPD) Strategy

Thank you for your willingness to participate in this study related to new product success. There are no right or wrong answers to the following questions especially considering that all new products and organisations are subject to changing internal and external factors.

Please indicate an X the extent of your agreement or disagreement with the following statements in relation to New Product Development in your CMG. The product that is being considered is the improved and revised version of the existing product i.e. EPPIX CCBS.

The scale refers to the following: 1=Strongly Disagree, 2=Disagree; 3=Do not agree or disagree; 4=Agree; and, 5=Strongly Agree

Factors Influencing New Product Strategy	Strongly Disagree	Disagree	Do not Agree or Disagree	Agree	Strongly Agree
SECTION ONE: CORPORATE STRATEGY					
01. New Product Development is guided by the corporate goals of the company					
02. Objectives for new product development projects are clearly defined					
03. Corporate strategy at CMG restricts or stifles the creativity necessary for new product development					
04. There is a fusion between technology-led and market-led innovations at the strategic level					
05. High levels of synergy (i.e. the relationship between New					

Factors Influencing New Product Strategy	Strongly Disagree	Disagree	Do not Agree or Disagree	Agree	Strongly Agree
Product Development and existing activities) exist within the company					
06. The climate in the company accepts risks when a new product is being developed					
07. Product development is the most favoured method of achieving corporate growth in your company					
08. Aggressive strategies are utilised favouring market penetration and market development for corporate growth					
09. CMG's new product strategy maximizes company's goals					
SECTION TWO: ROLE OF MANAGEMENT					
10. A high level of top management support exists in the process of product innovation					
11. Senior management are committed and involved at all stages of the NPD process					
12. Company executives encourage a culture of innovation and					

Factors Influencing New Product Strategy	Strongly Disagree	Disagree	Do not Agree or Disagree	Agree	Strongly Agree
entrepreneurship					
13. Top management defines the company culture					
14. Management style is appropriate to the demands of product innovation					
15. There are fewer layers of authority to speed the process of innovation					
16. Top management is responsible for good communication and free-flow of information amongst NPD project team members					
17. Top management combines technical commitment with marketing inputs					
SECTION THREE: ORGANISATIONAL CUTURE					
18. Experimentation is encouraged					
19. More time is consciously dedicated to thinking					
20. Free-flow of information is encouraged between employees					
21. Staff members share a common perception about the tasks in the					

Factors Influencing New Product Strategy	Strongly Disagree	Disagree	Do not Agree or Disagree	Agree	Strongly Agree
NPD project					
22. Positive internal attitude exists between staff members					
23. High levels of shared values characterise the company culture					
24. Tasks are designed around co-operative teamwork					
25. Harmony and stability are emphasized					
26. Considerable job mobility exists					
27. Work smarter, not harder philosophy is applied					
28. Suggestions are welcomed					
SECTION FOUR: ORGANISATIONAL STRUCTURE					
29. Organisational structure is free from rigid rules					
30. A participative and informal organisational style exists					
31. Many views are aired and considered					
32. Face-to-face communication exists with little 'red tape'					
33. Creative interaction and aims are					

Factors Influencing New Product Strategy	Strongly Disagree	Disagree	Do not Agree or Disagree	Agree	Strongly Agree
emphasized					
34. Organisational structure is flexible with respect to changing needs, threats and opportunities					
35. Organisational structure is non-hierarchical					
36. Information flows downwards as well as upwards					
37. Co-ordination within the NPD project team is undertaken by experts with a technical background in the area, and not a superior with authority from outside					
38. Power in the NPD projects team is distributed among the experts where appropriate					
SECTION FIVE: NPD PROCESS					
39. The product idea is compatible with company objectives, strategies and resources					
40. The concept of the new product is good enough for the end-users to say they would want to try the product					

Factors Influencing New Product Strategy	Strongly Disagree	Disagree	Do not Agree or Disagree	Agree	Strongly Agree
41. The marketing strategy to be developed for the new product is cost-effective and affordable					
42. The new product meets profit goals					
43. The new product is technically as well as commercially sound					
44. The new product meets company criteria for sales and market share					
45. The idea does not need to be sent back for product development					
46. Management has the skills and time needed for NPD					
47. The company has the financial resources required for NPD					
SECTION SIX: STAFF					
48. Functional co-ordination is identified as a critical factor contributing to the development of the new product					
49. Cross-functional skills are highly valued in the company					
50. Team members work together from start to finish during the					

Factors Influencing New Product Strategy	Strongly Disagree	Disagree	Do not Agree or Disagree	Agree	Strongly Agree
NPD process					
51. Teams are multi-disciplinary/multi-skilled					
52. There is a close relationship between functional co-ordination and the NPD process					
53. Team members feel responsible for and is able to work on any aspect of the NPD project					
SECTION SEVEN: INFORMATION					
54. Good and reliable information is available for making improved decisions about what and how to innovate					
55. The role of information is considered important in the NPD process for achieving product advantage					
56. Technical and marketing information are both accurate and timely in the NPD process					
57. Information is constantly reworked at in the light of the changing circumstances during the NPD process					

Factors Influencing New Product Strategy	Strongly Disagree	Disagree	Do not Agree or Disagree	Agree	Strongly Agree
58. Technical support for knowledge is available					
59. Centralised databases are available for supporting NPD within the company					
60. Networking of information speeds communications and cuts costs during the NPD process					

PART B: CONFIDENTIAL

(g) Your Name:

(h) Your company branch:

(i) Your position:

(j) E-mail address:

(k) Telephone:

(l) Any comments or suggestions you may wish to make considering this research study:

Thank you for your time in completing the questionnaire. If you have any queries, please do not hesitate to contact Miss T.Gengan at +27 83 782 2555

Or e-mail me at teenag@webmail.co.za.

APPENDIX 2: Pilot Study – Introduction Letter and Questionnaire

UNIVERSITY OF NATAL, DURBAN

DURBAN CAMPUS

GRADUATE SCHOOL OF BUSINESS

17 May 2002

Dear Sir/Madam

MBA RESEARCH QUESTIONNAIRE: PILOT STUDY

I am currently completing my MBA Dissertation at the University of Natal, Durban, South Africa. The title of my research is An Evaluation of A Telecommunications Solution Provider's New Product Development Strategy.

Your company has been selected for evaluation. Product Development of the EPPIX Customer Care & Billing System (EPPIX CCBS) will be investigated. The EPPIX CCBS is the "New Product" that I will be referring to in my study. According to academics in the field of New Product Development, the EPPIX CCBS is classified, in terms of its newness to the company and to the marketplace, as a product that provides improved performance or greater perceived value and replaces existing products with the later version (Booz, Allen & Hamilton). In this sense, CMG's product is a "new product". It is an improved product that is a development of existing products representing a meaningful alteration. The objective of my study is to identify whether CMG has the key characteristics of a leading innovator by investigating the factors influencing New Product Development success.

Your input will be of significant value to the existing body of knowledge in the field of New Product Development or otherwise termed Product Innovation. As you might know, the lifeblood of our organisations is the ability to satisfy the changing needs of our customers through the introduction of new products or product innovation. It is in this context that it can be said that product innovation is essential to corporate survival and growth.

The questionnaire you are about to fill forms part of the pilot study and consists of 3 parts. The purpose of this pilot study is to test the concepts that shall be used for the final questionnaire as well as to confirm the relevance of issues that

are being investigated. For this stage of the research study, the McKinsey's 7s Framework will be used as the basis for examining the relevant issues. You are one of the few chosen for this first stage and you are most welcome to participate in the next stage.

Please take note that individual results of this questionnaire are completely anonymous. Only aggregate data will be used to express results of the study. All information on your company gained from this study will remain confidential in accordance with the confidentiality agreement between the University of Natal and CMG-Wireless.

Your complete honesty in answering the questions will ensure the most accurate results. It is an evaluation of *your company* and will be most beneficial if responses to the questions reflect a true image of your company in relation to New Product Development.

In appreciation for your co-operation I would gladly forward for your attention and interest an executive summary at your request. The company will also receive a copy of my dissertation. The summary will provide an indication of the New Product Development Strategy that may be applied to increase chances of success.

Unfortunately, time has run out on this project and to enable me to complete this research, a swift response is needed from you. It would be appreciated if the questionnaire could be completed electronically. Once completed, please e-mail to teenag@webmail.co.za by the 24th May 2002. Should you have any questions whatsoever, I can be contacted on +27 83 782 2555 or the above e-mail address.

Thank you for your help and valuable time.

_____

T.Gengan

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MBA RESEARCH QUESTIONNAIRE: PILOT STUDY

An Evaluation of New Product Development Strategy

PART A: (Please type in answers immediately after questions. For the Yes/No answers delete the answer that is not applicable)

1) What do you understand by the concept of New Product Development?

2a) Does the company have a product development strategy that defines the new products to be developed?

- Yes
- No

2b) If yes, describe the strategy the company is using for New Product Development?

3a) Does the company have a product strategy that defines the resources to be utilized in New Product Development?

- Yes
- No

3b) List briefly the resources needed for New Product Development?

4) What specialist knowledge and techniques are there for executing New Product Development tasks?

5) What are the skills required to get product development completed quickly?

6) What information sources are used for the New Product Development process especially for idea generation?

7a) Is there a shared belief in the need to pursue product development for the purpose of growing the business?

- Yes
- No

7b) Describe the organizational culture (informal structures) and shared values that exist to encourage New Product Development?

8) What types of formal organizational structures are used to implement New Product Development tasks?

9a) Does top management provide active support for those involved in key product development tasks?

- Yes
- No

9b) Describe the sort of leadership style senior management is using for New Product Development?

10) Briefly describe the processes involved in New Product Development?

11) What other organizational (internal) factors do you believe have an impact on New Product Development?

12) What industry specific (external) factors do you believe have an impact on New Product Development?

PART B: LEVEL OF IMPORTANCE

Please indicate by an X the LEVEL OF IMPORTANCE of the following factors in relation to your company's new product. The product under consideration is the improved and revised version of the existing product i.e.EPPIX CCBS

Factors Influencing New Product Strategy	Not at all important	Not Very Important	Fairly Important	Very Important	Essential
	1	2	3	4	5
1.Corporate Strategy					
2.Role of Management					
3.Organisational Structure					
4.Organisational Culture					
5.People					
6.Skills					
7.Information					
8.Process of Product Development					

PART C: CONFIDENTIAL

a) Your Name:

b) Your company branch:

c) Your position:

d) E-mail address:

e) Telephone:

f) Any comments or suggestions you may wish to make considering this research study:

Thank you for your time in completing the questionnaire. If you have any queries, please do not hesitate to contact Miss T.Gengan at +27 83 782 2555 Or e-mail me at teenag@webmail.co.za.

APPENDIX 3: McKinsey's 7Ss Framework

Table 1:

A FRAMEWORK FOR ORGANISATIONAL ANALYSIS: McKINSEY's 7Ss	
Strategy	The plan leading to the allocation of resources
Shared Values	The goals shared by organisational members
Style	The cultural style of the organisation
Structure	The characteristics of the organisation chart
Skills	The distinctive capabilities of key personnel
Staff	The type of functional specialists employed
Systems	The nature of the control processes

APPENDIX 4: Computer Tabulations

Main Study: Raw Data

Table 1

	A	B	C	D	E	F	G	H
1	4	2	2	4	5	4	4	4
2	5	4	2	2	4	4	4	4
3	3	2	2	4	2	2	3	2
4	4	4	3	5	3	4	3	4
5	4	4	2	3	4	4	4	4
6	4	4	2	4	4	2	5	3
7	5	4	4	4	2	2	5	4
8	2	2	2	2	4	1	3	4
9	4	4	2	4	4	4	3	4
10	2	4	4	2	4	2	5	4
11	2	4	2	2	4	2	5	4
12	3	2	4	2	4	2	3	4
13	5	4	4	2	4	2	5	4
14	4	2	2	2	3	1	4	3
15	2	4	2	3	4	2	1	2
16	4	2	2	2	4	4	4	4
17	3	2	2	3	4	2	3	4
18	2	2	4	2	4	1	1	4
19	2	2	2	4	3	4	3	4
20	4	4	4	2	5	4	4	4
21	4	2	1	2	4	4	3	4
22	4	1	2	4	4	2	1	4
23	4	4	2	4	4	4	3	4
24	4	2	2	4	5	4	3	4
25	4	2	4	2	3	4	3	4
26	4	4	2	2	2	2	1	4
27	3	2	4	2	4	2	4	4
28	4	4	4	4	4	2	5	4
29	2	2	2	4	4	1	2	4
30	4	2	4	4	4	2	5	4
31	4	2	2	4	4	2	4	4
32	4	4	4	4	4	4	2	4
33	3	1	4	4	4	2	3	4
34	4	2	2	4	4	5	3	4
35	3	2	2	2	2	2	1	2
36	1	3	3	2	4	2	2	4
37	4	4	2	5	3	4	3	2
38	4	4	4	5	4	4	3	4
39	4	4	4	5	4	4	5	4
40	4	4	4	4	4	4	5	4

41	4	4	4	2	5	4	4	4
42	3	4	3	4	5	5	3	4
43	4	4	4	3	4	5	4	4
44	4	4	4	3	4	4	5	4
45	4	4	3	4	4	2	4	4
46	3	4	2	4	3	1	3	4
47	3	4	2	4	3	4	5	4
48	5	4	2	4	4	4	4	4
49	5	4	4	4	4	2	5	4
50	4	4	1	4	4	1	4	4
51	4	4	4	4	4	4	5	4
52	4	4	4	4	4	4	5	4
53	4	4	2	4	4	4	5	4
54	3	2	1	3	4	4	3	4
55	4	2	2	4	5	4	3	4
56	3	2	1	4	3	2	3	4
57	2	2	1	4	4	5	4	4
58	3	4	2	4	4	5	4	4
59	4	2	1	2	3	1	1	3
60	5	2	2	2	4	5	4	4

Frequency of Raw Data

Table 2

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	0	2	0	5	1
2	0	2	0	5	1
3	0	5	2	1	0
4	0	0	3	4	1
5	0	1	1	6	0
6	0	2	1	4	1
7	0	2	0	4	2
8	1	4	1	2	0
9	0	1	1	6	0
10	0	3	0	4	1
11	0	4	0	3	1
12	0	3	2	3	0
13	0	2	0	4	2
14	1	3	2	2	0
15	1	4	1	2	0
16	0	3	0	5	0
17	0	3	3	2	0
18	2	3	0	3	0
19	0	3	2	3	0
20	0	1	0	6	1
21	1	2	1	4	0
22	2	2	0	4	0

23	0	1	1	6	0
24	0	2	1	4	1
25	0	2	2	4	0
26	1	4	0	3	0
27	0	3	1	4	0
28	0	1	0	6	1
29	1	4	0	3	0
30	0	2	0	5	1
31	0	3	0	5	0
32	0	1	0	7	0
33	1	1	2	4	0
34	0	2	1	4	1
35	1	6	1	0	0
36	1	3	2	2	0
37	0	2	2	3	1
38	0	0	1	6	1
39	0	0	0	6	2
40	0	0	0	7	1
41	0	1	0	6	1
42	0	0	3	3	2
43	0	0	1	6	1
44	0	0	1	6	1
45	0	1	1	6	0
46	1	1	3	3	0
47	0	1	2	4	1
48	0	1	0	6	1
49	0	1	0	5	2
50	2	0	0	6	0
51	0	0	0	7	1
52	0	0	0	7	1
53	0	1	0	6	1
54	1	1	3	3	0
55	0	2	1	4	1
56	1	2	3	2	0
57	1	2	0	4	1
58	0	1	1	5	1
59	3	2	2	1	0
60	0	3	0	3	2
	22	112	55	254	37

Corporate Strategy

Table 3

	Disagree	Agree	Disagree %	Agree %
1	2	6	25.00	75.00
2	2	6	25.00	75.00
3	5	1	62.50	12.50
4	0	5	0.00	62.50
5	1	6	12.50	75.00
6	2	5	25.00	62.50
7	2	6	25.00	75.00
8	5	2	62.50	25.00
9	1	6	12.50	75.00
	20	43	27.78	59.72

Role of Management

Table 4

	Disagree	Agree	Disagree %	Agree %
10	3	5	37.50	62.50
11	4	4	50.00	50.00
12	3	3	37.50	37.50
13	2	6	25.00	75.00
14	4	2	50.00	25.00
15	5	2	62.50	25.00
16	3	5	37.50	62.50
17	3	2	37.50	25.00
	27	29	42.19	45.31

Organisational Culture

Table 5

	Disagree	Agree	Disagree %	Agree %
18	5	3	62.50	37.50
19	3	3	37.50	37.50
20	1	7	12.50	87.50
21	3	4	37.50	50.00
22	4	4	50.00	50.00
23	1	6	12.50	75.00
24	2	5	25.00	62.50
25	2	4	25.00	50.00
26	5	3	62.50	37.50
27	3	4	37.50	50.00
28	1	7	12.50	87.50
	30	50	34.09	56.82

Organisational Structure

Table 6

	Disagree	Agree	Disagree %	Agree %
29	5	3	62.50	37.50
30	2	6	25.00	75.00
31	3	5	37.50	62.50
32	1	7	12.50	87.50
33	2	4	25.00	50.00
34	2	5	25.00	62.50
35	7	0	87.50	0.00
36	4	2	50.00	25.00
37	2	4	25.00	50.00
38	0	7	0.00	87.50
	28	43	35.00	53.75

New Product Development Process

Table 7

	Disagree	Agree	Disagree %	Agree %
39	0	8	0.00	100.00
40	0	8	0.00	100.00
41	1	7	12.50	87.50
42	0	5	0.00	62.50
43	0	7	0.00	87.50
44	0	7	0.00	87.50
45	1	6	12.50	75.00
46	2	3	25.00	37.50
47	1	5	12.50	62.50
	5	56	6.94	77.78

Staff

Table 8

	Disagree	Agree	Disagree %	Agree %
48	1	7	12.50	87.50
49	1	7	12.50	87.50
50	2	6	25.00	75.00
51	0	8	0.00	100.00
52	0	8	0.00	100.00
53	1	7	12.50	87.50
	5	43	10.42	89.58

Information

Table 9

	Disagree	Agree	Disagree %	Agree %
54	2	3	25.00	37.50
55	2	5	25.00	62.50
56	3	2	37.50	25.00
57	3	5	37.50	62.50
58	1	6	12.50	75.00
59	5	1	62.50	12.50
60	3	5	37.50	62.50
	19	27	33.93	48.21

COMBINED FACTORS

Table 10

	Disagree	Agree	Disagree %	Agree %
Corporate Strategy	20	43	27.78	59.72
Role of Management	27	29	42.19	45.31
Organisational Culture	30	50	34.09	56.82
Organisational Structure	28	43	35.00	53.75
NPD Process	5	56	6.94	77.78
Staff	5	43	10.42	89.58
Information	19	27	33.93	48.21

Strategic vs. Project

Table 11

	Disagree	Agree	Disagree %	Agree %
Corporate Strategy	20	43	27.78	59.72
Role of Management	27	29	42.19	45.31
Organisational Culture	30	50	34.09	56.82
Organisational Structure	28	43	35.00	53.75
NPD Process	5	56	6.94	77.78
Staff	5	43	10.42	89.58
Information	19	27	33.93	48.21
Strategic			34.76	53.90
Project			17.10	71.86

APPENDIX 5: Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Corporate Strategy	8	21	35	30.50	4.57
Role of Management	8	17	31	24.50	5.32
Organisational Culture	8	29	44	35.13	5.69
Organisational Structure	8	26	38	31.88	4.70
NPD Process	8	30	38	33.88	2.59
Staff	8	17	28	23.25	3.58
Information	8	10	27	21.88	5.99
Strategic issues	8	103.00	142.00	122.0000	15.6935
Project related issues	8	57.00	88.00	79.0000	9.7980
Valid N (listwise)	8				

APPENDIX 6: CMG SWOT Analysis

SWOT ANALYSIS CMG EPPIX CCBS

STRENGTHS:

- CMG EPPIX was widely recognised as a market leader in Africa.
- CMG EPPIX had a more superior product than its rivals.
- The intellectual capital resource base of CMG was of a high calibre. Their engineers were highly skilled.

WEAKNESSES:

- The organisation was plagued with internal operating problems due to poor business processes, which contributed to subpart profitability in that lower revenues were achieved than the projected amount of 40%.
- Staff members were de-motivated, as they were unaware of the future of the company. This contributed to low staff morale.
- There was unhealthy competition between the SA office and UK office. This resulted in them operating in silos.
- The organisation had a weak balance sheet, which was burdened with huge losses.
- There was a complete lack of a clear strategic intent and vision within the organisation.
- CMG EPPIX were behind on product quality and development and technological know how. The CCBS product had excellent functionality but its architecture standards were of poor quality.
- Staff within the customer support division was inexperienced and insufficiently trained. This resulted in poor customer service and dissatisfied customers.
- The organisation had failed to attract new customers as rapidly as expected due to poor product and service attributes.

OPPORTUNITIES:

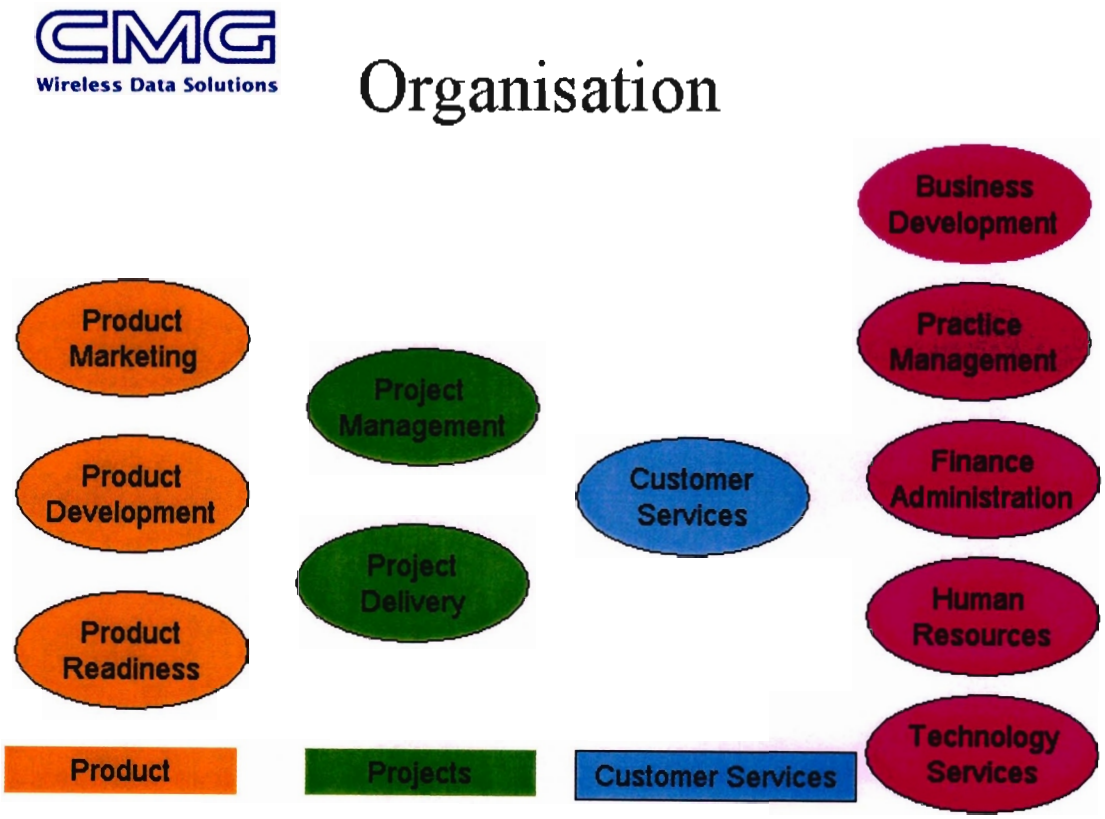
- The market was found to be conducive to the business. It was an open market that had opportunities for expansion.
- There are opportunities for CMG EPPIX to expand into the African regions and to increase their customer database within South Africa. Expanding the company's product line to meet a broader range of customers. CMG has competent and highly skilled engineers to develop the requisite product, which is strength to the company however the weakness lies in their lack of skilled salesman and customer support.

THREATS:

- Increase in number of competitors and new entrants within the market
- Down turns in telecommunications industry
- Negative shift in foreign exchange
- Technological changes or product innovations that undermine demand for the company's product. In the preceding period the focus of CMG EPPIX was on the development of the product to suit the needs of the tier 1 customer. In the market that CMG EPPIX operated there were no tier 1 clients. This resulted in a shift by the buyers away from the company's product.

Source: (Goko, Krishinchand, Maesela, Ngwepe, Singh & Pather, 2002:4)

APPENDIX 7: CMG Organisation Structure



Source: (CMG Database,2002)

APPENDIX 8: CMG Mission Statement

We will be the recognised leader in the provision of Customer Care and Billing solutions for Small and Medium Telecom Network Operators and Service Providers

Source: (CMG Database,2002)

APPENDIX 9: CMG Company Objectives

Customers: We want to constantly improve our business relationship and the satisfaction of our customers and of our channels to get to the level where they all proactively reference us.

People: We want to be a people focused company that constantly increases its Intellectual Capital and that practices the core values of challenge, trust and support in all interpersonal relationships.

Product Portfolio: We will have a long term Strategy, a Product Portfolio including innovative CMG and Third Party Products and a Roadmap which reflect our mission and are based on a detailed CCBS architecture.

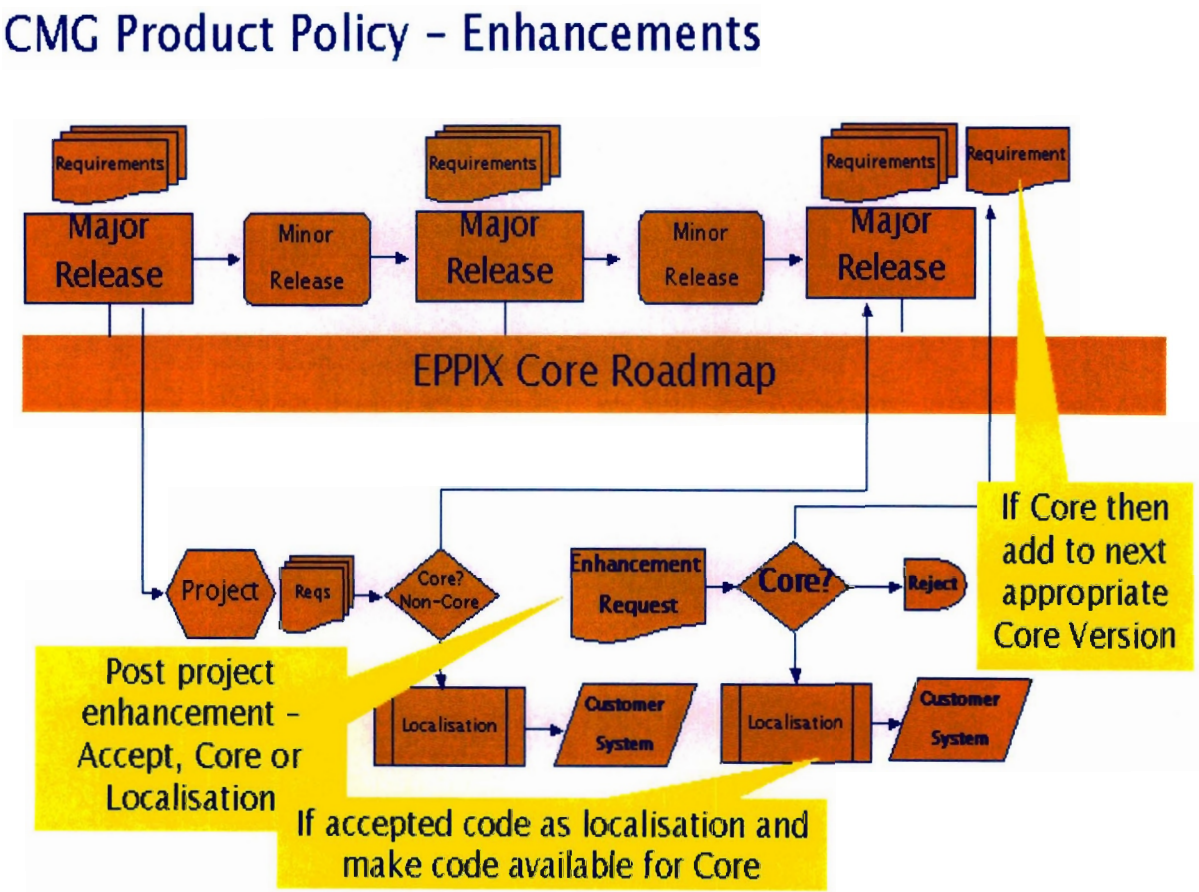
Services: We will offer high value adding Consultancy, Project Management, Implementation and Customer Services based on best of breed practices including high resource utilisation.

Quality: Our Quality Systems support the way we do Business such that our Customers recognise the high quality of our Proposals, Products and Services. We also measure our quality through ISO or equivalent certifications.

Finance: We want to grow our revenues faster than the market, be cash flow positive and generate at least 20% profits. We want to be predictable on a quarterly basis.

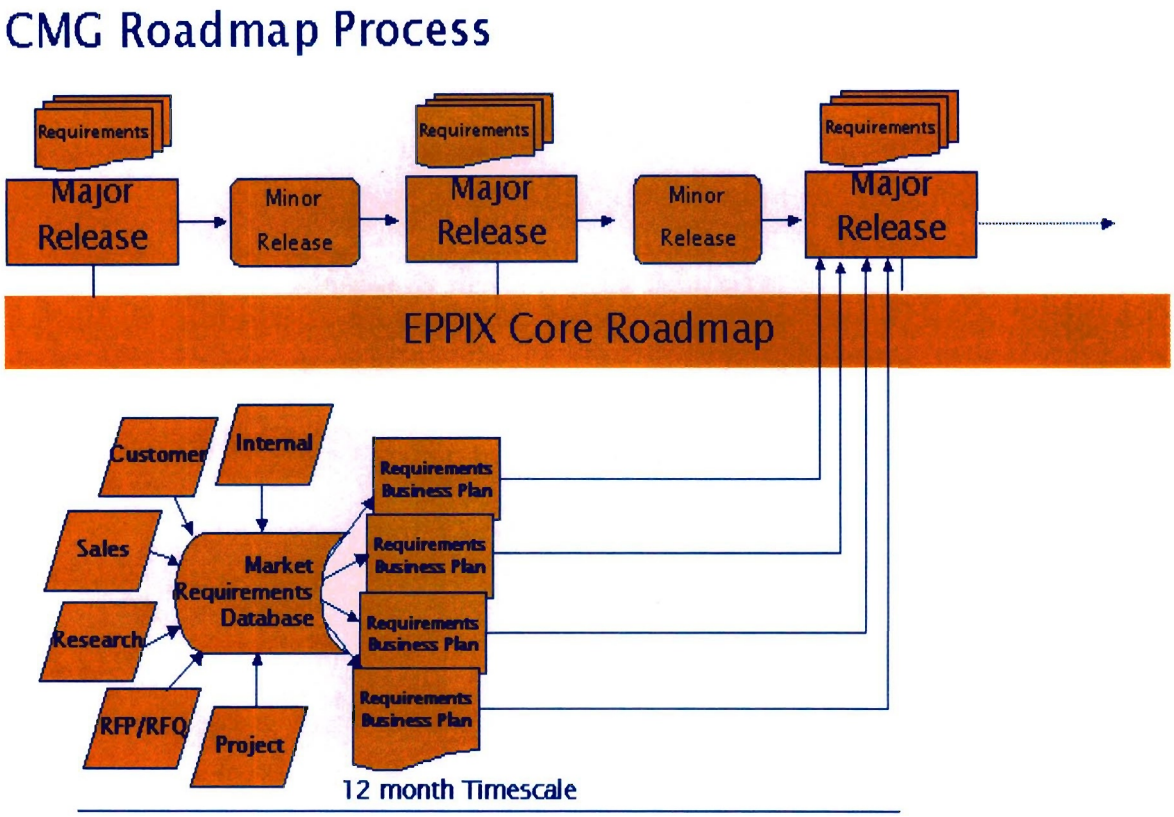
Source: (CMG Database,2002)

APPENDIX 10: Product Policy Enhancements



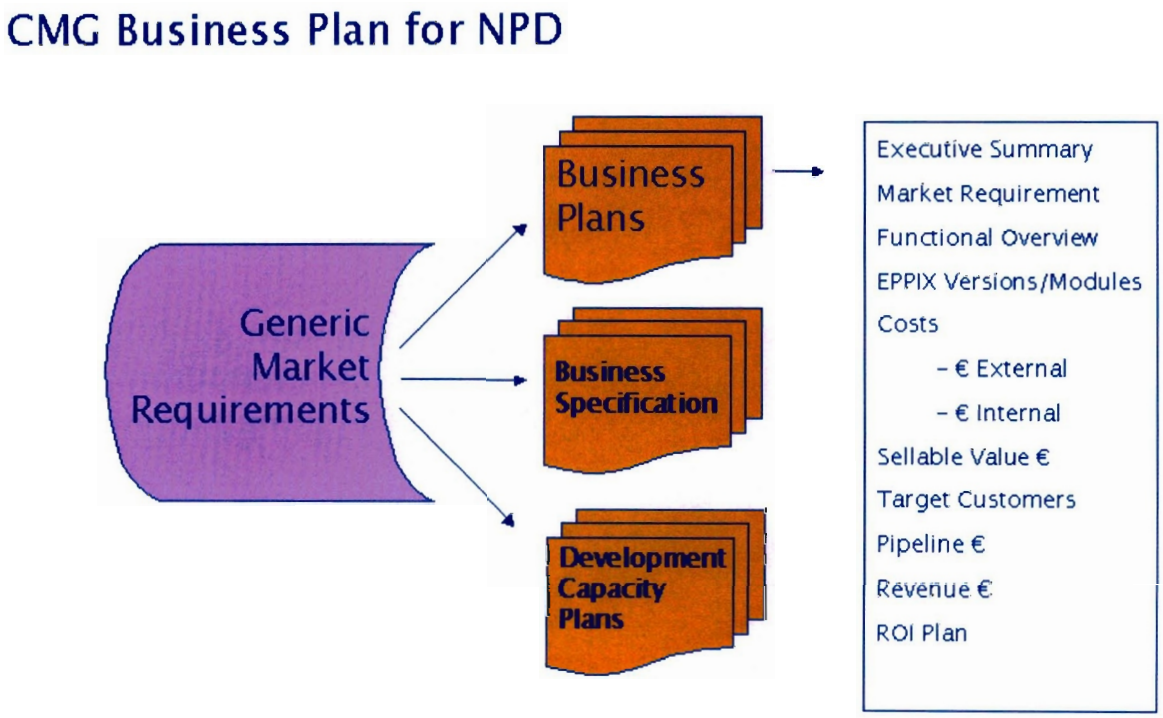
Source: (CMG Database,2002)

APPENDIX 11: CMG Core Roadmap Process



Source: (CMG Database,2002)

APPENDIX 12: CMG Business Plan for NPD



Source: (CMG Database,2002)

APPENDIX 13: Summarised Results of Pilot Study

1. The concept of New Product Development

- New Product development is the continuous efforts of the organization to grow the business. CMG is regularly examining roles that new products will play in our product portfolio and the growth of the company. In order to promote the effectiveness of our future NPD efforts, CMG management is committed to a structured approach to ensure that we focus our efforts on those areas that will grow the business.
- Development of a new product, or enhancement of an existing product, in response to a perceived or predicted new requirement in the market sphere

2. Product development strategy

- Inputs are received from different sources: Project Teams, Industry Reports, Industry Related Seminars, Client Feedback, Market Research
- The framework for new product development is in line with the International recognized GSM TM Forum strategy and OSS model. With regards to GSM specific functionality CMG is a member of the GSM Association and we strive to be compliant to the specifications released by the association.
- All new development proposals must accompany a business case that will be evaluated by the Product Board to determine the market and business value. If approved a detailed and realistic business plan must be completed. This will again be evaluated by the Product Board to determine the profitability and benefits to CMG.
- The company uses a two-pronged approach where both customer-specific and broader market related new requirements are evaluated for further development and/or inclusion in CCBS product

3 The resources needed for New Product Development

- This very much depends on the product proposed it can either be decided that CMG will develop the software within the EPPIX product or that a third party supplier will supply the functionality. The business plan submitted to the product board for evaluation will include a section that will detail all resource required, the cost for the required resources and the duration of involvement. Typically when developing in-house the resources will include software developers, QA specialists, Business Analysts and Trainers.
- Product specialists with the required product and market-related knowledge.
- Sales and marketing staff with knowledge of customer requirements.
- Technical staff expertise to develop the new functionality

4. Specialist knowledge and techniques for executing NPD

- CMG is an ISO registered company and procedures for the complete lifecycle from idea to actual product delivery are documented. CMG resources are one of its most valuable assets and we employ resources with many years of experience in the industry. Expert knowledge is shared and improved through the intellectual capital program implemented by CMG.
- Knowledge of the existing market, to evaluate enhancement requirements and their feasibility
- Technical expertise (analysts, designers and programmers) to realize these requirements in the product

5. Skills required to get product development completed quickly

Usually the skills required include:

- EPPIX Product skills: functionality, Architecture and design,
- Qualified Quality Assurance team with an understanding of the automation tools provided by CMG,
- Qualified and experienced developers with an excellent understanding of the CMG development environment and tools.
- Intensive research into the mobile market requirements, in order to be pro-active.
- Effective communication with customers and/or users, in order to identify their future requirements.
- Pro-active planning, organizational and technical skills required for JIT development of the functionality.

6. Information sources

- Client Enhancement Requests, Industry Reports, Industry Related Seminars, Feedback from project implementation teams, Client Feedback and requests, Market Research
- Market and Industry Reports that are accepted sources of information in the Telecommunications arena.
- Internet and printed industry specific magazines and newsletters.
- Feedback from existing and prospective customers.
- The expertise of in-house product specialists around product and market

7. Organizational Culture

- One of CMG's goals emphasize our commitment to develop our product portfolio in line with our long term market strategy: 'Product Portfolio – We will have a long term Strategy, a Product Portfolio including innovative CMG and Third Party Products and a Roadmap, which reflect our mission and are based on a detailed CCBS architecture'. Product Marketing is responsible for all new Product initiatives from idea to business plan and final commercial launch.
- A realization that the industry is a fast-moving one, where catering for new product requirements is an essential pre-requisite for continued success, or even existence, in the market.
- A high level of competition in the market place for winning and retaining customers.

8. Organizational Structure

- Product Marketing: Ideas, Business Plans and commercial launch
- Product Board consisting of top and senior managers: Evaluate new product concepts
- Development: Responsible for Product Development
- QA: Quality assurance for our own developed products or in the case of third part products they are responsible for Integration Testing and Quality Assurance
- Sales: Promotion of New Products

9. Management Style

- Open for new ideas – processes in place (and supported) by management to encourage new product ideas and development
- Recognize new ideas
- Product Management departmental managers are part of the senior management team, and are accorded the same weight as other managers.

10. The NPD Process

- Product Marketing Prepare business case if approved a business plan is written. Product Board Evaluate and approve and reject the concept. If approved budget is allocated and depending on the size of the project a project manager is appointed. Progress is reviewed on a weekly basis and at every Project Board Meeting. Phase here can include in-house development, Quality Assurance Product Launch to the Business and finally reviewed on a monthly basis to ensure the sales reflect what was described in the business plan.
- Requirements are identified from internal sources, customers, or the market place and forwarded to the Product Management department for review. More detailed business cases are put before the Product Board for evaluation. If accepted, the requirements are developed as stand-alone, customer specific of core product functionality.

11. Organizational (internal) factors impacting on NPD

- SA-UK Relationship
- Management and general staff awareness of the fast growing requirements of the industry and technology.
- A pioneering spirit or willingness to be innovative in the evaluation of the product.

12. Industry specific (external) factors impacting on NPD

- Telecom Market Trends
- Competitors
- Market Economics: Differences in telecom markets from one Region to the other usually determined by Regulatory factors, culture differences and Operator Types for example Predominantly prepaid or predominantly post paid, size of operation, etc.
- Development of new infrastructure, such as network and mobile technology innovations, which have an impact on the CCBS product.
- Social and human factors which require new user populations to have access to mobile technology.