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# *How diversity in top management characteristics affects the innovation strategy of mobile phone producers*


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## *Abstract*

As innovation is becoming more and more important for both scientists and firms alike, much research is being put into better understanding all aspects of how innovation comes about and why some innovation projects are successful while others are not. However now that several studies have been conducted into understanding why some firms are better in translating their innovation strategy into successful products, it is time to think about the step which comes before that: the process of the strategy definition. This research uses the upper-echelon theory to underpin the importance of the top management and investigates how the innovation strategy of a firm is affected by diversity within its top management team. As indicated in earlier literature, this relationship is assumed to be indirect due to the presence of some mediating variables which are included in this research. The firms chosen to be studied in this research are Nokia, Motorola and LG which are mobile phone producers. Since this is such a highly innovative industry there is a great need for high-quality innovation strategies. The research method of qualitative content analysis is used to examine the diversity in top management characteristics for these firms in the period of 2002-2010 and their influences on the included mediating variables and ultimately on the defined innovation strategies.

The results of this research show that diversity in top management team characteristics indeed has a profound effect on the innovation strategy as defined by the team. The task-oriented dimension of diversity, which includes the indicators of top management team tenure, industry background, job background and firm tenure, has a clear and direct effect on a firm's innovation strategies. A team with a higher degree of diversity in these indicators is better capable of defining high-quality innovation strategies if this diversity is exploited through a medium degree of task conflict between the top managers. The relations-oriented dimension of diversity, consisting of the indicators of gender, ethnicity and age, does not seem to have a direct influence on the innovation strategies of these firms. Only if a change in diversity of this dimension affects the task-oriented dimension could any relationship be identified. Based on these findings, several important implications to scientists and firms interested in innovation are presented.

# Table of Contents

# 1. Introduction

Innovation is increasingly becoming a more and more popular subject of study. As knowledge on innovation has progressed over the years, it has become apparent that innovation is indeed very important for firms in the sense that innovating firms show better growth and survival rates compared to similar firms which do not innovate (Carlin et al., 2004; Cefis and Marsili, 2005; Coad and Rao, 2008). Many different perspectives on innovation exist, ranging from the small view on individual innovation projects up to the big picture of Technological Innovation Systems (Cooper, 1990; Edquist, 1997; Slappendel, 1996; Tidd et al, 2005). A lot of research has also been put into determining factors that influence whether or not a planned innovation actually becomes a success in order to explain why some firms are more successful in innovating than others (Harborne and John, 2003; Horne and Martin, 1993; Slater and Mohr, 2006). However, what these and many other studies have neglected is the question of why and how firms actually formulate an innovation strategy. In other words, we must look deeper into the black box of strategic decision making (Carpenter et al., 2004). In order to do this, we must look at the department where this strategy is defined. Since the strategy definition of most large and high-tech firms takes place in a very top-down manner, the department responsible for the strategy is the top management (Talke et al., 2010). Taking a managerial-level perspective on the top management team is thus necessary to investigate the strategy of a firm. The influence of top management attention to individual innovation projects and the success-rate of such projects has been investigated (Cooper and Kleinschmidt, 1995), but what has been largely neglected is the question of how and why such projects were set-up in the first place.

## 1.1 The upper-echelon theory

The upper-echelon theory, which is embedded in the Strategic Management discipline, suggests that there is a connection between top management diversity and a firm's performance, where firms with a higher degree of top management diversity are said to perform better. Top management diversity can be split into two types of diversity: relations-oriented diversity (e.g. gender, age and ethnicity) and task-oriented diversity (e.g. top management team tenure, industry background, job background and firm tenure) which each has its own, sometimes opposite, effect on the firm's performance (Joshi and Roh, 2009; Williams and O'Reilly, 1998). However, empirical evidence for this direct relationship between top management diversity and firm performance has been rather weak as it depends on many moderating and mediating relationships. One of those mediating relationships is that between top management diversity and innovation strategy, where a more diverse top management team is suggested to be better in defining an innovation strategy that suits the available opportunities and needs on the market. This specific connection has only been researched once though, and only for single-product manufacturing firms (Talke et al., 2010).

This research will investigate the same relationship as the study by Talke et al. (2010), but in a high-tech industry and on firms which produce multiple products. As they mentioned in their study, the effects of top management team diversity on the innovation strategy could be even greater for large firms operating in knowledge-intensive, high-tech industries. Also, by investigating firms producing multiple products, a change in top management team diversity of a firm could lead to a shift in focus on the different products of that particular firm. The high-tech industry of choice for this research is that of mobile phone producers, with the specific firms being Nokia, Motorola and LG. The decision

to study this industry and these specific firms has been made for a number of reasons. Firstly, as indicated by Talke et al (2010), large firms operating in high-tech industries often have a greater need for the definition of high quality innovation strategies just to remain competitive in their markets. Secondly, the firms chosen are interesting in the sense that their success has fluctuated over the years due to their (in)ability to innovate, as will be further explained in the rest of this report. Studying their innovation strategies and the top management teams responsible for these strategies may thus provide new insights into the question how diversity can influence a firm's innovation strategy. Thirdly, with these firms being so large and well-known, there is an abundance of information available both on the firms themselves as well as their top managers.

In contrast to earlier studies this research will use a longitudinal design. By doing so, this research design helps "increasing the generalization of the findings by addressing the important concern of accounting for firm-specific, unchanging components, and thus, by controlling for potential factors, which may affect the investigated relationships" (Talke et al., 2010, p. 915). The time-line that is chosen for this research is that of 2002-2010. Reasons for this decision are given in paragraph 4.1 in which the specific cases are briefly described.

By conducting this research, interesting and important new insights into the relationship between top management team diversity and the innovation strategy can be obtained. This research will therefore provide a theoretical contribution to the literature on innovation due to the findings on this specific and important relationship. The research question (RQ) which will be central in this paper is therefore: *How does diversity in top management characteristics affect the innovation strategy of mobile phone producers?*

Based on previous studies it is suggested that the relationship in the research question is not a direct one, but rather that the top management diversity influences some *mediators*, and that these mediating factors in turn influence the innovation strategy. In general, a factor is said to function as a mediator when it (partially) accounts for the relationship between the independent and the dependent variable (Baron & Kenny, 1986). Mediators therefore explain why or how variable A influences variable B. Due to the nature of the research question of this paper, these mediators are assumed to be highly important as they answer the question how top management team diversity influences the innovation strategy of firms. Three mediators have been found in previous literature which are assumed to influence this relationship. These mediators are: future vision, policy on innovation and task conflict (Kor, 2006; Penrose, 2008; Tidd et al., 2005). Because of their importance, these three mediators are described at the end of paragraph 3.2. However there are also other factors which affect the strength and/or the direction of the relationships between the top management team diversity and the mediators, as well as between the mediators and the innovation strategy (Baron & Kenny, 1986). These factors are called *moderators* and have been identified in earlier literature as given in paragraph 3.2.2. The moderating factors in this research are: communication, competence based trust and power struggle (Narayanan, 2010; Pitcher & Smith, 2001; Van Knippenberg et al., 2004). Earlier literature has suggested their importance and therefore they will be used in this research to reconstruct the relationships between the independent variable and the mediators, as well as the mediators and the dependent variable.

Based on the overall RQ and the mediating factors, the first step in this research will be to identify any changes in the top management of Nokia, Motorola and LG during 2002-2010. Analyzing what

these changes have meant for the independent variable, top management team diversity, is described per firm for the period 2002-2010. In order to understand how the top management team diversity has affected the innovation strategy for these firms, the following sub-questions, based on the mediating factors, will be answered throughout this research:

*SQ1.1: How has top management team diversity of Nokia, Motorola and LG affected their visions for the future?*
*SQ1.2: How has the vision for the future of Nokia, Motorola and LG affected their innovation strategy?*

*SQ2.1: How has top management team diversity of Nokia, Motorola and LG affected their policies on innovation?*
*SQ2.2: How have the policies on innovation of Nokia, Motorola and LG affected their innovation strategy?*

*SQ3.1: To what extent was there task conflict between the top management team members of Nokia, Motorola and LG in the period 2002-2010?*
*SQ3.2: How has this task conflict affected the innovation strategy of Nokia, Motorola and LG?*

What still remains however is the question of how these mediating factors may have influenced each other. In order to give an answer to this question, a between-case comparison, in which the outcomes per case are compared with each other as described in paragraph 4.4, will be highly important. This fourth sub-question will mainly be used for theory-building on how the mediators in this research are interrelated and influence each other, as this is currently regarded as a research gap (Bao et al., 2007; De Dreu, 2006; Jehn et al., 2008; Konnola et al., 2007; Kuhn & Poole, 2000). While most of these studies have examined the relationship between diversity and one or several of the mediators and the resulting strategic decision, research on how these mediators have influenced each other is still largely lacking (Shevlin et al., 2010; Talke et al., 2010; Wong, 2011). These studies do suggest that deeper insight into these mediators would be beneficial for researchers studying firms' innovation strategies, as well as for firms trying to improve their strategic decision making process. These studies suggest that these mediators can significantly influence each other, leading to the fourth sub-question:

*SQ4: How have the mediators of task conflict, future vision and policy on innovation influenced each other for the cases of Nokia, Motorola and LG?*

## 1.2 Relevance

As explained the results of this research will contribute to the literature on innovation as it provides a new, currently uninvestigated perspective on innovation strategies of firms. A study by Talke et al. (2010) investigated the same relationship between top management team diversity and its influence on the innovation strategy of firms, however they did this only for firms that produced a single, simple product. Contrary to the research by Talke et al. (2010) this research will investigate this relationship for firms producing multiple different, and very complex products. As indicated in the paragraph above, mobile phones are very complex products with a basic distinction between software and hardware components. This thus means that, inherently, an innovation strategy of a mobile phone producer has more complexities than an innovation strategy of a firm which produces

much lower-tech products with only a few components. Additionally, Nokia, Motorola and LG all have different product lines of mobile phones. This means that they do not simply produce one mobile phone, but rather that they have a range of different models aimed at different consumer segments. Innovation strategy of these firms therefore likely incorporates the complexity of the devices as well as the differences between the product lines.

By analyzing these three multi-product firms in this high-tech sector over a certain period of time, new insights into the effects of top management team diversity can be obtained. By explaining the currently largely unresearched roles of the mediators in the relationship between top management team diversity and the innovation strategy, as well as how these mediators are interrelated, this research has a high theoretical relevance. It can therefore give a better insight into why some firms focus more on innovation and why some firms struggle a great deal in creating successful innovations in an industry where developments happen with such an enormous pace. By giving an answer to the question how top management diversity affects the innovation strategies of firms, this research also has some social relevance. As the value of innovation becomes ever more evident, it is important for a firm to establish a top management team which has the capabilities to define and carry out effective innovation strategies. The insights gained from this research can thus help firms in designing effective and innovative top management teams in order to secure a strong competitive position in a highly demanding industry. This research has thus a high relevance for scientists doing research on innovation as well as firms which find themselves in very innovative markets.

## 2. Context of the research

This short chapter will give an overview of the industry that is central to this research. It is important for the reader to have some basic knowledge of the industry and the basis of competition between firms active in this industry in order to understand innovation strategies and their importance to mobile phone producers.

The story of the mobile phone can be traced back to as early as the late 1930's when the predecessor of what is today Motorola started developing a mobile radio device called the SCR-536 in order to improve communication on World War II battlefields (Reller et al., 2009). However, these mobile devices were virtually unknown to the public until the late 1980's and early 1990's. During that period large firms such as Siemens, Ericsson, Nokia and Motorola were the frontrunners in the mobile phone industry, continuously pushing its frontiers further and further (Anderson & Jonsson, 2006). Back then, the industry was regarded as a perfect example of a vertically integrated industry, where these firms did not just control the mobile phones themselves, but also the mobile communications infrastructure these phones used. The mobile phone 'revolution' however did not begin until the second half of the 1990's, when developments in the computer industry helped the enormous boom in technological developments in mobile phones and their sales numbers (Reller et al., 2009). In just a matter of years we went from heavy, very expensive devices to smaller, lighter, faster and cheaper phones.

However as time went on, mobile phones became increasingly complex. Mobile phones were not only used for making phone calls any longer, but other digital technologies were included as well to enable new forms of communication (e.g e-mail, instant messaging), information and knowledge exchange as well as digital entertainment features. Due to the incredible pace of technological

developments in the mobile phone industry, sales numbers have exploded. While the total cumulative number of mobile phones sold in 1997 was only around 100 million worldwide, the number of mobile phones sold between 1997 and 2006 reached a staggering 4.6 billion units (ITU, 2009). While Western Europe, the US and Japan still account for the majority of mobile phone sales in relation to population, countries in Latin America, Asia, Africa and the Middle East currently show the highest growth rate in number of mobile phone sales (Gartner, 2005; Gartner, 2010). In these latter countries, a very large part of consumers are new users which have not previously owned a mobile phone. In Western countries however, the majority of mobile phones sales are accountable as replacement of older phones.

By continuous technological advances, broadening of functionality and changes in style trends, mobile phone producers are still able to sell large quantities of mobile phones in these markets which may seem saturated (McGuigan, 2005; Pertierra, 2005). The success of mobile phone producers is therefore highly dependent on their ability to produce mobile phones with ever increasing versatile functionality (Anderson & Jonsson, 2006). While mobile phones have already successfully integrated a certain amount of computer functionality, internet services, and multimedia technologies, mobile phone producers need to find ways to come up with ever improved products to entice existing customers to exchange their current mobile phone for a newer model. In other words, incremental innovation on all components that make up a mobile phone is hugely important for the competitive position and success of mobile phone producers. This thus also means that things have changed considerably over the years when taking a market perspective. At the beginning of the mobile phone era, there was little variety between different mobile phone models, both in terms of functionality as in terms of appearance. Today however, there is an incredible number of different mobile phone models, some almost identical and others vastly different from each other. This thus means that over the years, the overall market has split into several different market segments, such as children, multimedia users and business users.

Looking back at the development of mobile phones since the early 1990's and the development of the overall mobile phone market, one may start to wonder what has enabled these developments. The answer to this question can be found in the mobile phone industry itself and the mobile phone value chain. While the industry was a class example of a vertical industry in its early years, this has changed over the years. As an increasing number of specialized firms entered the market, producing just one or several related components of mobile phones, the mobile phone industry began 'unbundling' (Anderson & Jonsson, 2006). This unbundling meant that the mobile phone producers did not necessarily have to be very active in all parts of the mobile phone value chain, as new firms emerged specializing in providing components from specific parts of the value chain. As an effect of this, the industry transitioned from very vertical to more horizontal.

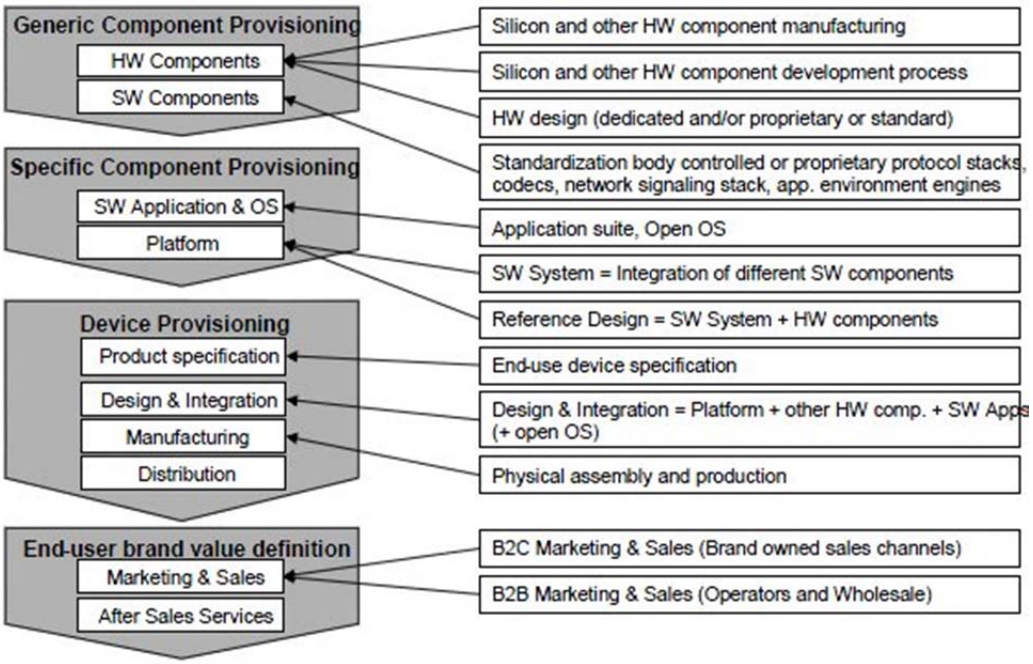



**Figure 1: The mobile phone value chain. Source: Anderson & Jonsson (2006), p. 11**

Figure 1 above illustrates nicely the value chain of a mobile phone. As said, in the 1980's and 1990's the large firms in the mobile phone industry where all active in all aspects of this value chain. As the used technologies and the mobile phone industry developed and mobile phones became increasingly complex, more and more firms entered the market which were specialized in one specific part of the mobile phone value chain. This process as well as technological improvements have enabled mobile phone producers to develop a stream of ever more compelling and different devices, which in turn has significantly changed the market over the years.

An example of a new firm entering the mobile phone industry is Google's move with the development of its operating system (OS) called Android. The development of this OS started in 2003 and was ready for release to the public in 2007 (The Boston Globe, 2007). The aim of Google was to become active in the mobile phone industry, on the level of Specific Component Provisioning as illustrated in figure 1 (Android Developers, 2009). The coming of Android as well as other firms specializing in specific parts of the mobile phone value chain meant that mobile phone producers could now choose to narrow their focus to the aspects of Device Provisioning and End-user brand value. This way, mobile phone producers no longer had to bother developing, for instance, an OS by themselves. However, adoption of an existing OS can mean that when other mobile phone producers adopt the same OS, product differentiation can go down. In order to address this issue, many mobile phone producers try to differentiate their products by designing their own graphical overlay on top of the general OS. By doing so, the underlying OS may be the same as that used by competitors but any mobile phone producer can still give its products a unique and distinctive look (Techno Buffalo, 2011).

## *2.1 Components of mobile phones and innovation*

As stated, mobile phones today are highly complex products consisting of many different components. Innovation is therefore possible in any of these components which means that the

strategies for innovation can be dissected into targets and strategies for component-improvement (ABI Research, 2006; Epcos, 2009). The basic distinction in mobile phone features can be made between hardware and software, as seen in the top-left of figure 1. While they are both very important in determining the overall user experience to the consumer, both hardware and software aspects provide many different areas for innovation. The hardware for instance consists of, among others, one or several displays, possibly some type of physical keyboard, different kinds of radio antennae, a central processing unit (CPU), a graphics processing unit (GPU), a battery, a SIM card slot, a memory card slot and the general design of the device. The software however consists of for example the general operating system (OS), an internet browser, a music player, the ability to install additional software and a virtual keyboard. As explained earlier in the introduction, the mobile phone industry is developing in such a rapid pace that the producers need to make continuous improvements on all aspects of their devices just to remain competitive. Thus, all of the aspects mentioned above can be improved and should continuously be questioned to spot possible opportunities for innovation. As the definition of the OECD states, these firms should strive to come up with "significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics" in order for their products to be as appealing to the market as possible (OECD, 2007).

In order to do so, incremental innovation is therefore regarded as highly important. As the average life of a mobile phone has been investigated to rarely exceed two years, the established mobile phone producers face the constant challenge of producing a new generation of devices that offers more value to possible consumers than the current generation of devices (Tan, 2005). If one of these producers fails to do so, this will have an immediate effect on its market share relative to its competitors. An example of this is indicated by Gartner about mobile phone producer Sony Ericsson which lost its position as the third largest producer of mobile phones in 2008, where Gartner states "as both music players and cameras have become more widespread in the competitors' portfolios, it has been more difficult for Sony Ericsson's Walkman and Cybershot product ranges to stand out. Lack of pure touchscreen devices also impacted overall performance in 2008" (Gartner, 2009). This is a simple example which shows how easily an established mobile phone producer can lose market share if it fails to keep up with its competitors in regard to innovation of its products.

In this industry, innovation is seen as a key factor in obtaining and sustaining a competitive advantage, which is defined by Porter (1985) as "…an advantage over competitors gained by offering consumers greater value, either by means of lower prices or by providing greater benefits and service that justifies higher prices". By making (incremental) innovation a key part of the corporate strategy of a firm, it stimulates itself to produce a continuous stream of innovation in order to remain competitive in this tough industry (Arora et al., 2004). Looking back to the example of Sony Ericsson, this firm used to have a competitive advantage with its music player and camera integration, however lost this competitive advantage as other mobile phone producers innovated to close the gap.

The highly important innovation strategy for the firms in this research will be dissected to see on which hardware and software aspects of their devices these firms focus their innovation efforts on, to make a continuous stream of competitive devices. The quality of the innovation strategy is therefore determined by the attention given to the various components which ultimately make up the devices (Campos, 1999). An innovation strategy is regarded as being of high quality when it

strives to find new ways, from both a hardware and a software perspective, to continuously improve the user experience of the produced devices in order to strengthen the competitive position of the firm. The specific cases for which this innovation strategy will be investigated are Nokia, Motorola and LG. These three firms are all well established, important players in this industry and are competing for market share with each other on the basis of continuous innovations. An explanation for these specific cases as well as a brief description of these three firms can be found in paragraph 4.1 of this report.

# 3. Theoretical framework

In this chapter, the theoretical basis of this research will be described. In order to give a basic picture of innovation strategies the process of defining an innovation strategy and why such a strategy is important will be described in paragraph 3.1. After this, the upper echelon theory is presented in paragraph 3.2 in order to explain why diversity in top management team characteristics would theoretically influence the resulting innovation strategy and a theoretical heuristic is presented. The important mediators and moderators included in this heuristic will be described from 3.2.1 onwards.

## 3.1 Defining an innovation strategy

To understand better why top management team diversity team influences the innovation strategy we first need to look into how this strategy is actually formed, that is the process of strategic decision making. In literature on corporate strategy and strategic decision making, the process of defining a strategy is often broken down into a series of steps. These steps are taken by the top management team, which is usually the level at which strategies are formed within a firm (Talke et al, 2010). Even though some researchers may use different steps to describe the process of strategic planning, they are all based on the following basic steps (Grienitz & Ley, 2007; Kaufman & Herman, 1991):

1. Gathering information (e.g. technological developments, market changes, current firm performance, feedback from lower levels in the organization)
2. Interpreting this information
3. Determining strategic goals
4. Translating these goals into a clear strategy

But what exactly determines the quality of an innovation strategy? According to Tidd et al. (2005) it is imperative that the innovation strategy adds value for the firm. This means that the strategy on innovation should help the firm producing competitive devices now, as well as in the future (Tidd et al., 2005). Previous research on the quality of innovation strategies has shown that overall, firms with good innovation strategies tend to invest more heavily in R&D as well as marketing and promotion, and focus more on the development of new opportunities and products than firms with a lesser quality of innovation strategy (Leskovar-Spacapan & Bastic, 2007). As Neely et al., (2001) found in their research, the most innovative firms have a good strategy on innovation which is driven by total customer satisfaction and total quality management. A good innovation strategy should thus focus on the development of a continuous stream of products with ever improved characteristics, by

making use of new opportunities whenever they arise, in order to satisfy the customers optimally and efficiently (Campos, 1999).

As one can imagine, no single top manager can define an effective innovation strategy on his own due to the overflow of available information and the inherent complexity of such a strategy. This process of strategic planning is therefore highly dependent on the interaction between the members of the top management team (Building et al., 1994; Narayanan, 2011). In order to determine how top management team diversity affects the final innovation strategy we thus need to look at how this diversity would affect the process of defining the strategy. This will be done by using the upper echelon theory which will be described in the following paragraph.

## *3.2 Upper echelon theory*

The most dominant strand of literature used in this research is that of the upper echelon theory which comes from the literature on Strategic Management. This theory is based on the notion that large, complex firms are structured in a top-down way, where the corporate strategies are usually defined at the top by the top management team (Carpenter, 2002; Certo et al., 2006; Hambrick, 1987). In their article, Hambrick and Mason (1984) state "upper echelon characteristics as determinants of strategic choice, and through these choices, of organizational performance" (Hambrick & Mason, 1984, p. 197). In their view, the organization can be seen as a reflection of its top managers and their characteristics. In order to examine why a firm's strategy is as it is, we must thus look at the top management team responsible for the strategy according to this theory. The quotation above of Hambrick and Mason (1984) is especially true for large firms with many different departments, which are usually organized in a formal, top-down manner. Seeing that Nokia, Motorola and LG, the firms included in this research, are indeed firms with thousands of employees and with a large number of very different departments, the upper echelon theory should be very much applicable to these firms.

What is so important about the characteristics of the top management team is that they form their personal *cognitive basis.* As written by Nooteboom et al. (2007), this cognitive basis "denotes a broad range of mental activity, including proprioception, perception, sense making, categorization, inference, value judgments, emotions, and feelings, which all build on each other" (Nooteboom et al., 2007, p. 1017). The idea of the upper echelon theory is thus that having members of a top management team with a different cognitive basis allows these team members to stimulate each other to come up with novelty. The nature of the upper echelon theory is that it only looks at internal factors for strategic choices, specifically at the top level of a firm. A possible shortcoming of the theory is thus that it tends to neglect external factors, such as successful strategies of other firms, which may influence the strategic decisions made by the top management. Additionally, one might argue the theory tends to put too much focus on the top management of a firm. In the case of large firms with a complex structure, some of the tasks which the upper echelon theory assumes to belong to the top management team may be transferred to a lower level in the organization. Other scientists such as Carpenter (2002) and Tacheva (2007) however have indeed statistically proven a relationship between top management team composition and a firm's overall performance.

### 3.2.1 Top management team diversity

Since the cognitive basis for each individual is determined by his or her personal characteristics, a difference in the cognitive basis of individuals arises from differences in these characteristics. It can therefore be said that for a top management team to formulate a successful strategy, diversity in these characteristics is desirable. Diversity in these characteristics can be aggregated into two groups: relations-oriented diversity and task-oriented diversity.

Relations-oriented diversity means diversity on characteristics such as gender, age and ethnicity (Talke et al., 2010). Some previous research on relations-oriented diversity in groups of individuals has been conducted and most results have indicated that such diversity negatively affects group performance (Simons et al., 1999). This research has indicated that relations-oriented diversity often leads to the formation of subgroups, inter-group bias and stereotypic perceptions of others. The result of this is that the quality of decisions made by a group in which these events occur can be shown to be of lower than those made my groups without these problems (Joshi and Roh, 2009).

Task-oriented diversity (e.g. top management team tenure, industry background, job background, firm tenure) however has been shown to generally have a positive effect on firm performance. Differences in these indicators lead to differences in the cognitive basis of the various members of the top management team (Williams and O'Reilly, 1998). As explained in paragraph 3.2 above, having differences in the cognitive bases of group members allows for these group members to stimulate each other in coming up with high-quality decisions. As the research by Williams and O'Reilly (1998) shows, this proposition can indeed be proven empirically.

Looking at the outcomes of these previous studies regarding these two types of diversity it thus seems that it is in a firms best interest to stimulate task-oriented diversity to ensure strategic decisions of high quality, while keeping relations-oriented diversity at a low enough level to avoid problems in dynamics of the top management team. What this means for a firm is that its top managers should have some diversity in their personal backgrounds, previous job functions and their industry experiences (Kilduf et al., 2000; Williams and O'Reilly, 1998). The results at the end of this research will show whether or not evidence for this hypothesis can be found for the three cases examined.

### 3.2.2 The relationship between the upper echelon theory and innovation

The upper echelon theory has guided scientists in previous research to investigate a direct relationship between (diversity in) top management characteristics and firm performance, but this direct relationship has been difficult to prove (Carpenter et al., 2004; Reis et al., 2007). What these studies have shown is that the relationship between top management characteristics and firm performance is indirect and influenced by moderating and mediating factors as represented by the scheme below.

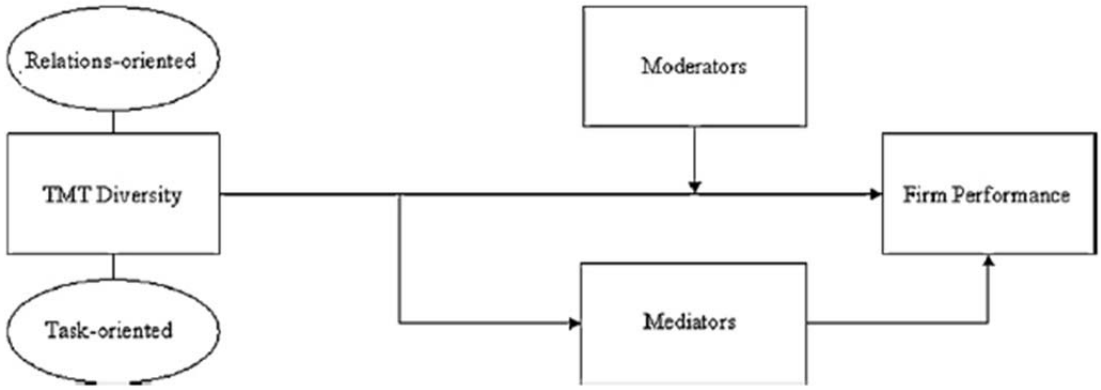



**Figure 2: Variables that may affect the relationship between TMT diversity and the firm performance. Source: Talke et al (2010) p. 909**

Surprisingly though, a lot of research not empirically investigated these theoretical mediating relationships (Carpenter et al, 2004; Hambrick, 2007). Especially the relationship between top management team characteristics and strategic choices has received little attention (Hambrick, 2007; Li & Hambrick, 2005; Shih & Lin, 2008). Even though the quote in paragraph 3.2 from the founders of the upper echelon theory Hambrick and Mason explicitly states that there is a direct link between top management team characteristics and strategic decisions, very little empirical evidence on the subject exists. Nevertheless, it is a very important relationship as numerous earlier findings suggest that a firm's competitive position can be characterized by the strategic choices it made (Chen et al., 1992; Fleming et al., 2009; Naranjo-Gil & Hartmann, 2007; Talke et al., 2010; Wright & Beaumont, 2001). One very important strategic decision for a firm is the choice made about its innovation strategy as described in paragraph 2.1 (Carmeli et al., 2010). Especially in fast-developing industries, such as the mobile phone industry, innovation is critical for a firm's ability to compete with other firms. In figure 2 though, this innovation strategy is simply an uninvestigated mediator that is assumed to influence the relationship between top management team diversity and firm performance. As this mediator is assumed to be very important, this research will go deeper into the relationship between top management team diversity and the innovation strategy by opening up the black box of this strategic decision making process. In order to do so, this research will use the top management team diversity as a starting point. It will not try to seek an explanation as to why this diversity exists, but rather what the possible effects of this diversity are on the innovation strategies of Nokia, Motorola and LG. This will be done by identifying moderators and mediators that influence this specific relationship. These mediators and moderators are therefore not necessarily the same as those included in earlier literature using the upper echelon theory, as most of them have used firm performance instead of the preceding innovation strategy as the dependent variable.

What should be kept in mind though about figure 2 is that the independent variable of top management team diversity is possibly not purely exogenous, but rather partly endogenous. As argued earlier it is vital for mobile phone producers to have a good innovation strategy and innovate on virtually all aspects of the devices they are producing. In such a high-tech industry there is a clear link between the innovation strategy of a firm and that firm's performance (Coad & Rao, 2008; Cooper, 1984). It is likely however that a certain *performance feedback loop* exists between a firm's performance and its innovation strategy (Feurer & Chaharbaghi, 1995). This means that a high firm performance, due to a successful innovation strategy, strengthens the innovation strategy process on

the short term (Greve, 2003). On the longer term however, such an effect is likely to be weaker as competitors to the firm are stimulated to improve their innovation strategy process even faster. Additionally, whenever a firm has a poor innovation strategy and as a result the overall firm performance is falling, the top management team can be held accountable. If this occurs current top managers may be replaced by other people, who possibly possess different characteristics. After controlling for a set of variables explained in paragraph 3.2.5, diversity in top management team characteristics can therefore be argued to be affected by the success or failure of previous innovation strategies a

### 3.2.3 Mediators

As illustrated in figure 2, the relationship between top management team diversity and the firm performance is not simply a direct one. Rather, there are some mediating and moderating factors influencing this relationship. One of those mediating factors is that of the innovation strategy, which is the dependent variable in this research. Like the relationship in figure 2 however, the relationship between top management team diversity and the innovation strategy is also assumed to be influenced by mediating and moderating factors. Since it is so important to understand these mediating factors they will be described per mediator in the rest of paragraph 3.2.3. These mediators are derived from both the upper echelon theory as well as literature on innovation management and strategic decision making.

#### *Task conflict*

The first variable that is considered to be a mediator between top management team diversity and innovation strategy is that of task conflict. This mediator explains that when diversity between team members increases, chances of conflicts between group members must increase as well. This idea makes sense looking back to the theory of cognitive distance, as this means group members can have clearly different views which would stimulate discussion between them. While one might rationally think conflicts are negative for the process of strategic planning, it is suggested that task related conflicts are positive while relations oriented conflicts are indeed negative. Scientists have previously conducted research into this issue, and found that the more complex a group-task is the higher the benefit of task conflict (Jehn, Northcraft and Neale, 1999). As the process of strategic planning is a highly complex one, one can assume that task conflict is indeed beneficial during the process of defining a strategy. Studies by Pelled, Eisenhardt and Xin (1999) and Olsen et al. (2007) have included this very relationship in empirical research and have found that indeed task conflict due to task-relevant cognitive distance leads to strategic decisions which are measurably of higher quality than decisions made without such conflict. As Olsen et al. (2007) clearly state “although task conflict can generate relationship conflict, which can be detrimental, we affirm that task conflict is extremely important in highly complex decisions that are crafted in an ever-changing environment” (Olsen et al., 2007, p. 197). In fact, some scientists go even further by claiming that without task conflict, benefits of top management team diversity cannot be materialized (Amason, 1996; Milliken & Martins, 1996). This means that if there were no occurrences of task conflict between top management team members, diversity in information sources and interpretation would not have a positive effect on the innovation strategy. However for task conflict to occur, there has to be a certain overlap in the tasks of top management team members. As members of a top management team are usually the heads of the different divisions and their departments of a firm, they often have

clearly different tasks and responsibilities. Especially in very large firms with different business units operating in very different markets, the top management team may struggle to define a successful innovation strategy for each of the business units (Penrose, 2008; Song, 1982; Vaona & Pianta, 2006). For such firms, it may be desirable to have some overlap in tasks of the top management team members in order to stimulate positive task conflict.

### *Future vision*

The second mediating variable that is considered to be important in this research is that of the future vision defined by the top management. Previous research has shown that creating a future vision of the firm and the market is an important step in effective strategy making (Tidd et al., 2005). This future vision should be communicated throughout the firm as it is vital for the success of a firm to have its employees know in which direction the firm is headed for the future. Diversity in top management characteristics could influence this variable since this diversity often leads to new viewpoints and ideas about the future, thus possibly resulting in a different future vision (Nooteboom et al., 2007). The future vision in turn can have a big impact on the innovation strategy. Since this vision gives all employees an idea of the future position of the firm, innovation strategies are defined to hopefully turn that vision into reality. A good future vision should question all aspects of the devices as given near the end of paragraph 2.1, in order to stimulate innovation on all these aspects which is so important for these firms' competitive position.

### *Policy on innovation*

Underlining the overall policy on innovation of the firms is a third variable in the theoretical heuristic of this research, which is assumed to influence the relationship between top management team diversity and the innovation strategy. As indicated by several scientists, a firm's innovative performance –and in turn its overall performance- is generally very positively related to the extent to which innovation is perceived as an integral part of a firm's corporate strategy (Kor, 2006; Pappas, 1984). It is argued that a greater diversity in top management team characteristics in the sense of previous industry experience and job backgrounds leads to more attention for innovation (Bantel and Jackson, 1989). In turn, more attention to innovation and its importance in the overall corporate strategy can enable a firm to define a clear policy on innovation, which is how the firm frames innovation as a guide for the firm. Having such a comprehensive policy on innovation can have a very positive effect of the innovation strategy itself (Pitcher & Smith, 2001). This is especially true for firms operating in high-tech industries, where product lifecycles are short and developments follow each other rapidly (Lu & Yu, 2010). Since the mobile phone industry in which Nokia, Motorola and LG operate is characterized by such huge technological developments, the top management team has the responsibility to enable their firms to remain up-to-date to these developments. In order to do this, the top management is often highly involved in creating a supportive policy on innovation. Such a policy enables the firm to remain competitive by being able to spot and exploit possible opportunities for innovation. Firms with such a clear policy on innovation often set a bigger budget for innovation and are able to spot and exploit more innovation opportunities. Such a policy can for instance include the drive to actively work together with different organizations in order to remain on the cutting edge of technological developments.

### 3.2.4 Moderators

As suggested in figure 2, the mediators given above are not the only factors affecting the relationship between top management team diversity and the innovation strategy. There are also certain moderating factors, which influence this relationship in either a positive or negative way. These moderating factors will be explained below. As the moderators will be treated as exogenous variables in this research, they are only used to reconstruct the relationships between the other variables in the answering of the sub-questions and they will not be further operationalized.

#### *Communication*

As argued by many scientists, communication among top management team members is a critical component in the process of strategic decision making (Narayanan et al., 2010; Tidd et al., 2005). Without extensive communication between members of the top management team, they cannot express their views and opinions and the potential value of diversity in their characteristics cannot be realized (Kickul & Gundry, 2001). Extensive communication is thus regarded as a moderator which positively influences the relationship between diversity in top management team characteristics and the innovation strategy.

#### *Competence-based trust*

Related to the moderator above and the mediator of task conflict is the moderator of competence-bases trust, meaning that competence-based trust strengthens the relationship between top management team diversity and task conflict (Olsen et al., 2007). The level of competence-based trust between group members is defined by the degree to which the group members have respect for, and confidence in, the other team members. Teams with higher competence-based trust are likely to produce a more in-depth analysis of the issues at hand, as they feel more comfortable to openly discuss with one another because they feel that their views and opinions are valued by the other team members (Van Knippenberg et al., 2004). As research by Van Knippenberg et al. (2004) and other have shown, teams with a higher degree of competence-based trust indeed push each other to greater heights, being aware of the fact and comfortable with it that task conflict is highly valuable in making strategic decisions of high quality.

#### *Power struggle*

The moderating factor of the structure of power is the last moderator included in this research which could influence the relationship between top management team diversity and the innovation strategy. This factor explains the role for each member of the top management team, by looking at his or her responsibilities within the team and the firm and to what degree there is any power struggle. While it is argued that diversity in top management team characteristics could lead to a valuable degree of task conflict, the responsibilities and personal agendas of the team members could lead to a struggle for power (Computerworld, 2000; Pitcher & Smith, 2001). When this occurs, the power struggle hampers the process of strategic decision making as members of the top management team are unlikely to come to a consensus on the issues at hand and what the best strategic decisions are. Especially when members of the top management team have very different backgrounds, i.e. large diversity in characteristics, and a high level of relations-oriented diversity the chances of power struggle occurring within the group increase (Pitcher & Smith, 2000).

### 3.2.5 Context variables to control

In addition to the mediators and moderators that have been defined above, there are also additional factors which could have an influence on the innovation strategies of the three firms in this research. These factors can be regarded as the firm-specific or industry context in which these firms operate. As this context likely to be of influence on the examined relationships, it will have to be controlled for by identifying so-called control variables. The control variables included in this research will be described briefly in this paragraph.

#### *Firm size*

The size of the firm is the first control variable which will be included in this research. As indicated in numerous other studies, the size of a firm is usually of influence on that firm's strategy and the strategic decision making process (Arthur, 1994; Helablian & Finkelstein, 1993; Hitt et al, 1996). As this variable is exogenous to the upper echelon theory but could be of significant influence on the researched relationships, this variable has to be taken into account.

#### *Firm age*

A second control variable is that of firm age. Again, other studies have revealed that the age of a firm can greatly influence the innovation strategy of that particular firm (Boeker, 1997; Huergo & Jaumandreu, 2004a; Huergo & Jaumandreu, 2004b). Even though empirical evidence on the influence of firm age on strategic decision making is at this point still ambiguous, it is indeed a variable that should be taken into account when comparing three different cases to each other. This control variable will therefore be taken into account when conducting the analyses in this report.

#### *Previous innovation strategy*

The third control variable which will be used in this research is that of the previous innovation strategies of firms. In different industries, evidence has been found that states that the strategic decision making process within firms is often heavily influenced by decisions made in the past (Barnes et al, 2004; Coombs & Hull, 1997; Golden, 1992). What this implies for the innovation strategies of mobile phone producers is that these firms are unlikely to make very large changes to their innovation strategies over a short period of time. Because the previous innovation strategies of the three firms included in this research may be very different, this variable needs to be controlled for in the analysis of the data.

#### *Diversity in industry activities*

Another factor which could influence the innovation strategies of these three firms, and therefore has to be controlled for, is that of the number of industries these firms are active in. Comparing the mobile phone innovation strategies of three of these mobile phone producers may give a distorted result if one of those firms is only active in the mobile phone industry, while the two other firms are active in a much broader range of industries (Barczak, 1995; Ginsberg & Venkatraman, 1985; Thornhill & White, 2007). In order to solve this problem, the context of the firms in regard to their active industries must therefore be accounted for.

# 4. Methods

As stated earlier, the method which will be used to answer the research question is that of a multiple case-study. In the following paragraph, the three cases will be discussed shortly after which the process of data collection is described.

## 4.1 The cases

The first case as used in this research is that of Nokia. Nokia began producing mobile phones in the 1980's and launched its first mass produced mobile phone using the GSM network, called the Nokia 1011, in 1992 (Smith, 2007). Ever since, Nokia has been a very dominant player in the mobile phone industry, gaining the highest market share in the industry on a global scale (Gartner, 2010). Nokia's portfolio of innovations include items such as the world's first smartphone which are more feature packed and more expensive than regular mobile phones (MENAFN, 2011; PCWorld, 2009). However over recent years Nokia's market share has been falling (Businessweek, 2010). In order to address this problem Nokia has made some significant changes in its top management by creating new top management positions and replacing some of its top managers, hoping to define better strategies in order to regain its competitive position (Cellular News, 2009 Glassdoor, 2009; GSM Dome, 2010; International Business Times, 2010). Seeing that Nokia's top management has changed so much over the recent years makes it an interesting case to examine to what extent these changes have actually influenced its innovation strategy. Since Nokia's sales numbers and market share have shown a lot of fluctuations since 2002, its highest ever market share, the time line chosen for this case is 2002-2010 (BBC News, 2006). This time period is interesting as between those years, Nokia has apparently been struggling in producing a continuous stream of valued innovations to the market.

For Motorola, the story was even darker. In 2007, Motorola lost its position of second largest mobile phone manufacturer to Samsung, with sales being approximately 38 percent lower in the fourth quarter of 2007 compared to the fourth quarter of 2006 (Businessweek, 2008; Market Watch, 2008; Trusted Reviews, 2008). After major changes in its top management where most of its top managers were replaced by other people both from within the firm as well as by outsiders, Motorola reported that its Mobile Devices division earned a positive amount of $87 million in the second quarter of 2010 (GSM Arena, 2010). Due to these vast changes in Motorola's top management and its performance, this is also a very interesting case to examine in this research (PCWorld, 2008). The time-line chosen for this case is also from 2002 to 2010. The Motorola Razr launched in 2004 meant a new era for Motorola and a huge increase in sales of its mobile phones (Motorola, 2006). Tracing this innovation back to the innovation strategy defined earlier by its top management as well as the period that followed, this case can give a better insight to how a firm can be successful in a market at one point in time but struggling to continue being competitive in such an innovative industry.

The third and final case of LG can also prove very useful for this research. The South-Korean firm launched its first mobile phone in 1996 on the South-Korean market (Recombu, 2010) and has come a long way since then. During the late 1990's LG expanded its mobile phone business by entering the US and Australian market, providing these markets with handsets based on the CDMA technology (LG, 2009). In the early 2000's LG's mobile phone business expanded further when it began selling mobile phones in Europe, Russia and the Middle East based on GSM technology (LG, 2009). Since then LG has managed to continuously increase its global market share, eventually becoming the third-largest supplier of mobile phones worldwide (Gartner, 2010; IDC, 2011). In contrast to the

former cases, the mobile phone division of LG has not seen a dramatic decrease of market share, but rather the firm has shown itself to be very capable in realizing steady growth in market share numbers as well as profits (LG, 2010). Investigating LG's top management team, how it has used the mediating factors proposed in paragraph 3.2.1 and its evidently successful innovation strategies between 2002-2010, allows this research to find out why LG has been so successful in defining its innovation strategies.

In order to give answers to the sub-questions and the overall research question as given in the introduction, the first step that needs to be taken is collect data on all of the relevant variables of this research. The second step will be to systematically analyze the gathered data to identify the scores for all relevant variables.

## *4.2 Operationalization*

In this paragraph, the operationalization will be given of the independent and dependent variables, as well as the mediating concepts included in chapter 3. As already stated in paragraph 3.2.2, the moderating variables will not be operationalized. They will only be used to theoretically back the connections between the other variables. To give a clear overview of all concepts, dimensions and indicators, this operationalization will be presented in the form of a table included in this report in Appendix 1. At the end of this paragraph, figure 3 will be presented in which the suggested relationships between the variables are illustrated clearly.

**Top management team diversity**
This concept, which is used as the starting condition of this research, consists of two dimensions: relations-oriented diversity and task-oriented diversity. Based on the previous descriptions given of these two dimensions and earlier studies using this concept, the indicators for relations-oriented diversity are: age, gender and ethnicity. Age will be measured in years on a ratio scale ranging from 0-70. The indicator of gender will be measured nominally by classifying male as M and female as F. The last indicator of this dimension, ethnicity, will be measured nominally by attributing to each top management team member his or her country of origin. Aggregating the scores of these indicators, a total score for the dimension of relations-oriented diversity can be determined. This score will be based on a 3-point Likert scale, ranging from 1: low to 3: high.

The indicators for the task-oriented dimension are top management team tenure, job background, industry background and firm tenure. Since these second and third indicators on the backgrounds are so qualitative, they will be summarized nominally by giving labels per industry and job orientation. The indicators of top management team tenure and firm tenure will be measured in years on a ratio scale, determining how long the top management team members are a part of this team and the firm itself. The scores for these four indicators will be again aggregated to form a score for the dimension of task-oriented diversity. This dimension will also be scored on a 3-point Liker scale ranging from 1: low to 3: high.

**Task conflict**
Task conflict is the first mediating concept in the theoretical heuristic and is defined by the indicator of overlap in job emphasis of top management team members. As explained in the last few pages, previous studies have shown that task conflict between top management team members has a positive influence on the strategic decision making process. However for this positive task conflict to

occur there needs to be a form of overlap in the task emphasis of the top management team members. This overlap will be indicated by an ordinal 3-point Likert scale ranging from 1: low overlap to 3: high overlap. As indicated in the literature on task conflict as described in the previous chapter, the relationship between task conflict and the innovation strategy is that of an inverted U-shape. This means that there is an expected optimum point of task overlap which in this case will be labeled with 2.

**Future vision**

Based on the book of Tidd et al. (2005) and literature on the mobile phone industry, the concept of future vision can be divided into two dimensions: Timespan and nature of the vision. The timespan of the vision will be measured categorically in the number of years, for which the following categories are identified: 1-2 years, 3-5 years, 6-10 years and 11+ years. The dimension of the nature of the vision will also be measured using categories. A firm's future vision will be analyzed by using the following categories and identifying from which categories elements are incorporated in the future vision: new markets, changes in existing markets, developments in hardware components, and developments in software components. A good future vision should include elements from all four of these categories over a larger number of years, as only then does a firm truly think about innovation on all aspects of its future devices.

**Policy on innovation**

For the concept of policy on innovation three dimensions have been identified: drive for cooperation with other organizations, focus on internal R&D and the role of innovation for the firm. The first dimension, drive for cooperation with other organizations, will be measured on 3-point Likert scale, ranging from 1:low drive to 3: high drive, by assessing the drive for the firm to cooperative with other firms within its innovation strategies. The second dimension of focus on internal R&D is split into two indicators: percentage of employees involved in R&D and the percentage of earnings spent on R&D. The third dimension of the role of innovation for the firm will be measured nominally by giving the label CO to a conservative role while giving the label CE to a more cutting edge role.

**Innovation strategy**

The dependent variable of the innovation strategy is split into two dimensions: the focus of the innovation strategy and the quality of the innovation strategy. In order to determine the focus of the innovation strategy, innovation strategies are analyzed for the innovation activities of different product characteristics. These characteristics are measured by the categories of new product lines, improvements in design, improvements in hardware components and improvements in software components. The category of new product lines is included in this dimension of the innovation strategy as these new product lines allow the firms to respond to changes in the existing markets as well as develop products for possible new markets. The second dimension, quality of the innovation strategy, is very much related to the focus of the innovation strategy. As stated in paragraph 3.1, producers in such an innovative market as that of mobile phones should continuously improve all aspects of their devices. This thus means that an innovation strategy of very narrow focus, for instance only focusing on the hardware components of mobile phones, is of low quality as it neglects a large part of what determines the overall user experience which will result in a decrease of the competitive ability compared to other mobile phone producers (Macdonald, 2010). This dimension of the innovation strategy quality will be measured on a 3-point Likert scale ranging from 1: low quality to 3: high quality. The innovation strategy will score a 3 only if it integrates all aspects of its devices in

the innovation strategy, which means a firm looks for competitive advantage on aspects relevant for the final user experience (i.e. design, hardware and software) (Macdonald, 2010; Wahl, 2006).

### 4.2.1 Control variables

**Firm size**

The control variable of firm size will be measured by looking at two dimensions. The first dimension is the number of employees and the second dimension is the annual net income. The number of employees of a firm will be represented on a ratio scale as the total number of employees within the firm. The second dimension of net income will also be measured on a nominal scale, by analyzing the annual reports of each of the firms in order to obtain their respective incomes.

**Firm age**

Like the dimensions of firm size, firm age will simply be measured on a ratio scale representing the number of years for which each firm has existed.

**Previous innovation strategy**

As the variable of the previous innovation strategy is regarded to influence the current innovation strategy, the previous innovation strategy needs to be controlled for. The previous innovation strategy of a firm on year X will be the innovation strategy of that firm in year X-1 as defined on the previous page. For example, the innovation strategy of LG in 2004 will also represent LG's previous innovation strategy in 2005.

**Diversity in industry activities**

The number of active industries in which each firm is active is also regarded as influential on these firms' innovation strategies as explained in the previous chapter. In order to measure this variable, the number of industries each firm is active in will first be counted. After this, the 3-point Likert scale will be used to classify the diversity of industry activities of each firm. A firm will score a 1: low diversity if it is active in 1 or 2 industries, a 2: medium diversity if it is active in 3-5 industries or a 3: high diversity if it is active in 6+ industries.

The figure 3 which is presented below represents the relationships between the variables, based on the literature from chapter 3 and the operationalization given in this chapter. As can be seen, an increase in the diversity of top management team is thought to improve the scores for the mediating variables of task conflict, future vision and policy on innovation. In turn, these mediating variables are assumed to positively influence the innovation strategy that is defined. From the three moderators that are used to reconstruct these relationships, the moderators of communication and competence-based trust are regarded as positive moderators, which means they strengthen the relationships between the independent variable and the mediators as well as the relationships between the mediating variables and the innovation strategy. One moderator, structure of power, however is assumed to negatively influence these relationships due to a lower ability for the top management team members to work with each other cooperatively.

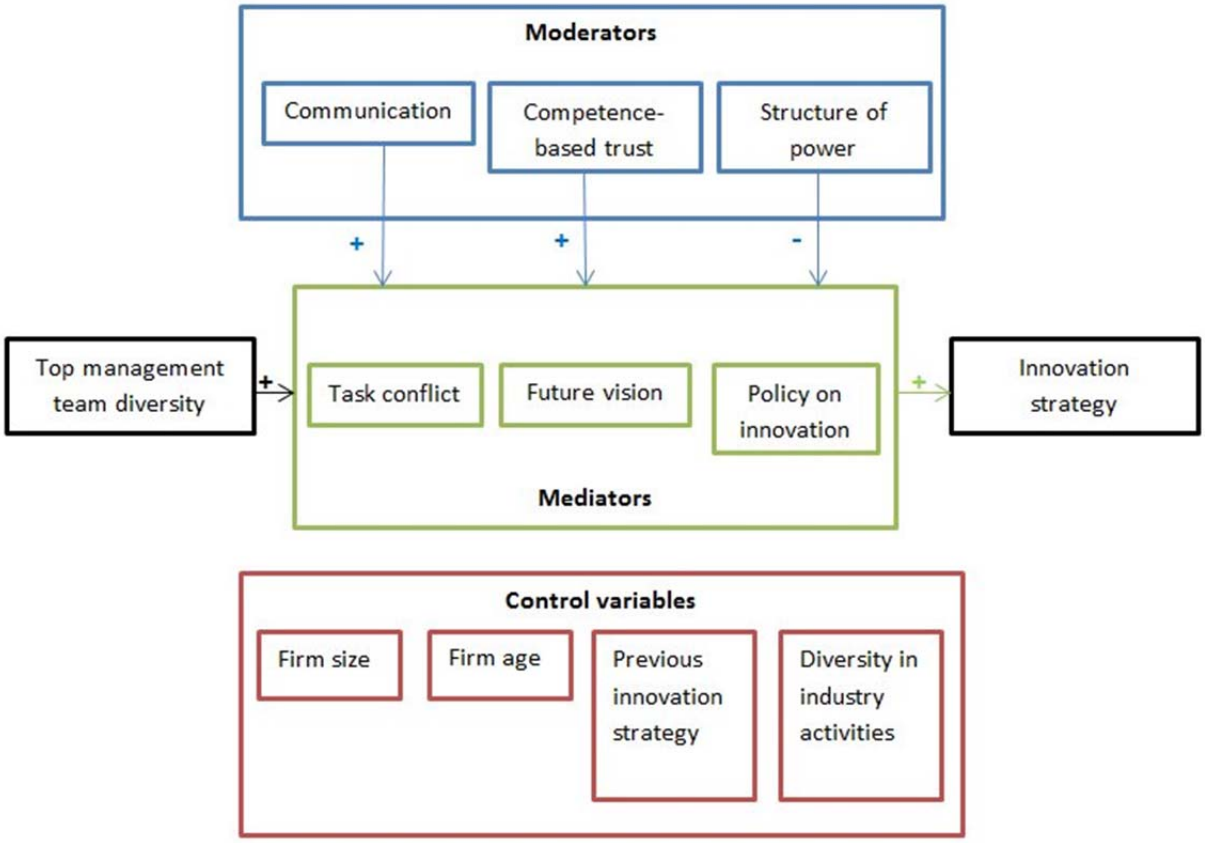



**Figure 3: The suggested relationships between the variables**

## 4.3 Collecting data

Now that all of the variables that are included in this research have been operationalized, data has to be collected in order to determine per firm, a score for each variable for a particular point in time. In order to gather a sufficient amount of data on each variable, numerous different sources of information will be used. In this paragraph, the different sources of data will be discussed as to the useful data they provide and their reliability.

**Annual reports**

All three firms present the most important information about their firm in their annual reports. In these reports, each firm gives, among others, an overview of its top management, its financial position, its most important activities, a reflection of the previous year and an outlook for the future. Due to this abundance of information, these reports will be highly valuable in determining scores for the indicators of top management team diversity, the mediators and the innovation strategy. In addition to this, the annual reports can also be used to determine the context variables of each firm. As these annual reports are written by each firm in order to provide interested people, such as shareholders, a comprehensive and honest view of the firm the reliability of these reports are considered to be high (Beattie & Jones, 1992; Li, 2008).

**Personal profiles**

A second source of data is that of personal profiles of the top management team. As stated, annual reports usually give an overview of the top management team of a firm. The overview in an annual report however may not be detailed enough to determine a score for all indicators of top

management team diversity. In order to solve this potential problem additional information on top management team diversity will be gathered from personal profiles of the top management team members, in order to better define a score for the indicators such as previous industry experience. These personal profiles can usually be found on the firm websites as well as the websites www.linkedin.com, www.businessweek.com and www.forbes.com. Although a person could simply make up information on a profile website such as LinkedIn, the reliability of top management team members can be noted as high as any falsehood would be too risky for someone with a high-level position, especially a top management team member (Infopreneur Media, 2010).

**Newspaper articles**

Newspaper articles will form a third source of data in this research. Useful articles will be sought using the online database LexisNexis which contains articles of many of the world's leading international newspapers. By using search phrases such as 'Nokia innovation', more useful information can be gathered on especially the mediators of future vision and policy on innovation, as well as on the innovation strategy and the moderators. The reliability of such newspaper articles is considered to be somewhat lower than the two former sources of data (Swank, 2000). As research has shown, even famous and highly accredited newspapers may show some form of bias or misreporting in their articles (Ortiz et al., 2005). Because of this, the reliability of newspaper articles will be classified as medium.

**Specialized websites**

In order to gather even more information on the variables of future vision, policy on innovation and innovation strategy, specialized websites will be examined as well. The websites that are used in this research are www.engadget.com, www.gizmodo.com and www.cnet.com which are all leading websites when it comes to news articles on electronic gadgets in general, including mobile phones. The same search phrases used for the LexisNexis database will be used for these websites in order to identify articles that are relevant to this research. The reliability of this data source is classified as medium. While some articles may be highly reliable in that they are based on simple and verifiable facts, other articles may be based more on rumors or the author's own interpretation of specific information (Vedder & Wachbroit, 2003).

**Industry events**

The last source of data used in this research will be information from industry events. Every year, several events such as the Consumer Electronics Show (CES) and the Mobile World Congress (MWC) are held where mobile phone producers can show their new devices and reveal some of their plans for the future. Especially the presentations given at these events can reveal information on the future vision, policy on innovation and the innovation strategy of the firms, which is all important for this research. As these presentations are given by people from within the specific firm, highly involved in the development of future mobile phones, the reliability of the information in these presentations is considered to be high. The information from these presentations will be retrieved by examining the specific firm websites, the specialized websites explained above as well as videos of the presentations found on www.youtube.com.

### 4.3.1 Overview of the data

| Source | Found on | Useful information | Reliability |
|---|---|---|---|
| Annual reports | Firm websites | - Top management | High |

| | | | |
|---|---|---|---|
| | | diversity<br>- All three mediators<br>- Innovation strategy<br>- Context variables<br>- Moderators | |
| Personal profiles | Firm websites, www.linkedin.com, www.businessweek.com and www.forbes.com | - Top management diversity | High |
| Newspaper articles (e.g. USA Today, Wall Street Journal, Financial Times, The Guardian, The New York Times) | LexisNexis | - Mediators: Future vision & Policy on innovation<br>- Innovation strategy | Medium |
| Specialized websites | www.engadget.com www.gizmodo.com and www.cnet.com | - Mediators: Future vision and Policy on innovation<br>- Innovation strategy | Medium |
| Mobile phone events | Firm websites, specialized websites, www.youtube.com | - Mediators: Future vision and Policy on innovation<br>- Innovation strategy | High |

**Table 1: An overview of the data sources**

## *4.4 Data analysis method: Qualitative Content Analysis*

As argued in the introduction there are two types of analyses carried out in this research. The first type is a within-case analysis, in which an analysis is conducted for each firm to define how exactly the variables presented in the conceptual model have influenced each other in the case of that particular firm. After this analysis has been conducted separately for each of the firms, a between-case analysis is carried out in order to determine whether or not any anomalies have arisen from the first three analyses and if so, how this can be explained. This second type of analysis will thus be very important in the final generalization of the results of this research.

In order to determine what exact type of analysis is carried out, we must first distinguish existing qualitative analysis types in order to pick the right one. Firstly, since this research will analyze a vast body of documents to determine how a set of variables has changed over the years, this research will use a method belonging to the *archival strategies* as defined by Wolcott (1992). In particular, it will use the *qualitative content analysis* method in order to analyze the data in a systematic manner in order to come to an answer on the central research question.

A content analysis is an ideal method for analyzing large bodies of information from among others reports, websites and presentations in order to search for contexts, underlying meanings, patterns and processes between and within the data sources (Altheide, 1996; Krippendorff, 2004). This is achieved by examining these texts and translating important bits of information into codes and categories which help the researcher in finding an answer to the research question. Within the qualitative content analysis method there are three different approaches most commonly used: conventional, directed and summative (Hsieh & Shannon, 2005).

With the conventional method, the coding categories are derived directly from the data itself and are thus formed without notion from prior theory or literature. In the directed method however, the initial codes are formed using an existing body of literature and/or prior research as guidelines. The third approach to qualitative content analysis involved the counting and comparison of bits of data, usually specific keywords, followed by an interpretation of the underlying context of the occurrences of these keywords. Since this research is based on the upper echelon theory, theory on innovation management and prior research dealing with these theories, the codes used in this research are thus formed on the basis of this body of literature, meaning that the directed approach of qualitative content analysis is chosen for this research. Indeed, as Hsieh and Shannon state, "*the goal of a directed approach to content analysis is to validate or extend conceptually a theoretical framework or theory*" (Shieh & Shannon, 1995, p. 1281) which is precisely the aim of this research.

But how exactly will the content analysis be used to answer to sub-questions and main research question of this research? In order to answer this question, we must look at how the content analysis will be used, by identifying its *principal purpose* (Mayring, 2000) and *specific use* (Berelson, 1952). The principal purpose of a content analysis as stated by Mayring (2000) can be characterized as one of the following: describing the manifest characteristics of communication, making inferences as to the antecedents of communication, making inferences as to the consequences of communication or making inferences about the content of communication. This research will use the content analysis for the purpose of making inferences about the content of communication, as it is the specific content of the documents to be analyzed that contains useful information about the relevant variables in this research. The specific uses of the content analysis, of which seventeen are given by Berelson (1952), is to reveal the focus of attention, attitudes, interests and values of the top management teams of the three firms and how this has affected their actions in the period 2002-2010. By deploying this method successfully, the different sources of data as presented in table 1 are analyzed systematically in order to identify the scores for all included variables and identify relationships between these variables on the basis of this research's sub-questions. In total, a number of 843 documents have been found to contain useful information for this research.

### 4.4.1 Coding of the data

In order to conduct this content analysis in a systematical and with relative ease, the computer software Nvivo 9 will be used. This software allows the user to easily and clearly code specific parts of large bodies of text. In this research, the software will thus be used to aggregate all useful documents per firm, and then highlight and code specific parts of the documents that contain information on one or more indicators of top management team diversity, task conflict, future vision, policy on innovation or the innovation strategy. Based on the information in the document, a score can be given to the coded text on the basis of the operationalization. These scores can then be used to hopefully come up with conclusive answers to the sub-questions and the overall research question.

However in order to analyze these documents successfully and gather enough evidence for a reliable answer to each sub-question and the research question, the theoretical propositions that form the basis of the conceptual model need to be translated into a set of empirical questions which need to be addressed in the documents (Elu & Kyngäs, 2008). These empirical questions will be presented in a table on the next page.

| Variable | Empirical question | Codes |
|---|---|---|
| TMT diversity | 1. Has the diversity of the TMT of the firm changed?<br>2. In what way has it changed?<br>3. Why has it changed? | - Change in TMT diversity<br>- Reason for change in TMT diversity<br>- Effect of change in TMT diversity |
| Task conflict | 4. Has the task conflict within the TMT of the firm changed?<br>5. In what way has it changed?<br>6. Why has it changed? | - Change in task conflict<br>- Reason for change in task conflict<br>- Effect of change in task conflict |
| Future vision | 7. Has the future vision of the firm changed?<br>8. In what way has it changed?<br>9. Why has it changed? | - Change in future vision<br>- Reason for change in future vision<br>- Effect of change in future vision |
| Policy on innovation | 10. Has the policy on innovation of the firm changed?<br>11. In what way has it changed?<br>12. Why has it changed? | - Change in policy on innovation<br>- Reason for change in policy on innovation<br>- Effect of change in policy on innovation |
| Innovation strategy | 13. Has the innovation strategy of the firm changed?<br>14. In what way has it changed?<br>15. Why has it changed? | - Change in innovation strategy<br>- Reason for change in innovation strategy<br>- Effect of change in innovation strategy |

**Table 2: An overview of the empirical questions and related codes**

As can be seen in the table above, the empirical questions which form the guidelines of the qualitative content analysis have been translated into a set of basic codes. These particular codes are used in the content analysis to mark useful bits of information. Any range of text can be marked with several codes, as any particular sentence may cover information about several of the empirical questions given above.

By using these codes on all of the relevant documents during each within-case analysis, changes in any of the variables in 2002-2010 come forward. Conducting this research in this systematic, qualitative approach on this large number of documents, means the reliability and the validity of the conclusions drawn in this research are high. The simple but important codes presented in the table above assure that changes in any of the variables, the reason behind these changes and the effects thereof will be identified for each of the cases. After these three within-case analysis have been carried out, a between-case analysis is conducted in which the results of the three cases are compared to each other. On the basis of these systematic analyses, strong and reliable conclusions can be drawn at the end of this research.

# 5. Case 1: Nokia

The first analysis that will be carried out is for the case of Nokia. As explained, numerous sources have been used to collect data on all theoretically relevant variables for this research. In total, 145 documents have been gathered for Nokia to analyze all of these variables for the period 2002-2004. For the rest of this chapter these variables will be discussed and possible connections between them

will be identified. In the very end of this chapter, on page 43, a timeline will be presented showing some of the most important events for Nokia between 2002 and 2010.

**Control variables**

The control variables, as discussed earlier, form the background of the firms included in this research. As they are important to put the rest of the analyses into perspective, the control variables for Nokia will be discussed first.

The first control variable included in this research concerns the age of the firm. One can say Nokia really is a great example of a long lasting firm, as it was founded in 1865. Then a small papermaking firm, it transformed itself into a telecommunications giant ever since it entered the industry in the 1960's. The second control variable that will be discussed is that of the firm's range of industry activities. As for Nokia, the firm was and is very much concentrated on the mobile phone industry. Even though the firm had some small experiments in other industries, its major business has continuously revolved around mobile phones and mobile network equipment during 2002-2010, thus receiving a score of 1: low diversity for its industry activities. The third control variable concerns the size of the firm which is measured by two dimensions. In 2002, the beginning of this research, Nokia had on average 45.500 employees within its entire organization. With this number of employees, it managed to generate an annual net income of approximately $3.550.000.000 (Nokia, 2002).

***2002-2004***

In 2002, Nokia's top management team consisted of ten people. Looking at their personal profiles, it is clear that both relations-oriented and task-oriented diversity existed between the members of Nokia's top management team in 2002. Graphs that show the diversity per indicator have been included in appendix 2 of this report. As far as ethnicity goes, there was no diversity between the top management team members as all ten of them were Finnish. For the other relations-oriented indicators, gender and year of birth, diversity did indeed exist. While nine of the top managers were male, there was just one female in Nokia's 2002 top management team. As for the diversity of year in birth, the oldest top manager was born in 1943 while the youngest in 1961. The overall score attributed to the dimension of relations-oriented diversity is therefore 1: low diversity. To determine the score for task-oriented diversity we must look at the indicators of top management team tenure, job background, industry background and firm tenure. With the shortest tenure being less than a year and the longest tenure being sixteen years in 2002 and the rest of the top management team tenure being spread between those years rather well, it is clear that the top management team tenure was rather diverse in 2002. The indicator of firm tenure shows a lower amount of diversity. While the numbers of years each person has been with the firm ranges from six to 25, six of the ten top managers had been with the firm for more than seventeen years. Related to this indicator is that of the industry background. As most of the top managers in 2002 had been with Nokia for the majority of their careers, there was a low degree of diversity in industry backgrounds of the different top managers. The fourth and final indicator, job background, does show a high degree of diversity. The different top managers also had different job backgrounds, meaning that a lot of diverse job experience was present in the top management team. Aggregating these four indicators, the score for the task-oriented dimension of diversity is 2: medium diversity.

Within Nokia's top management team of 2002, there was a high degree of task conflict. Because Nokia was a firm only active in the production of mobile phones and mobile phone network

equipment, each of the top managers was, in some way, concerned with innovation in mobile phones. Because of this high degree of task overlap, Nokia could potentially make full use of the knowledge that existed within its entire top management team.

Now, let's take a closer look at the other variables of future vision, innovation policy and the innovation strategy. In the years preceding 2002, Nokia's market share steadily grew by focusing mostly on the hardware side of its devices, in the sense of given the highest importance to improving on designs as well as technical functionalities in its innovation strategy. As this had paid of tremendously in the years preceding 2002, Nokia followed along this path during 2002. This already seems to confirm the positive feedback loop, where successful strategies in the past are often followed closely in the future in pursuit of even greater success. Within the firm, there was a shared belief that hardware was, and should continue to be, the main focus in the innovation strategy. This vision was clearly communicated during an interview in July 2002 between a New York Times reporter and Matti Vanska, a then highly ranked employee of Nokia's software department, when Mr. Vanska stated: "*The software business for Nokia is strategic, but not in the sense of gaining revenues. We want a harmonization of the technology base"* (Lohr, 2002). This citation was very characteristic for Nokia's strategy in 2002, where the software department was simply there to serve the hardware department. In regard to its innovation policy, Nokia was fairly driven to cooperate with other organizations. Cooperation with other firms was used mainly to reassure it would have the right technologies and equipment to produce its phones. This thus does mean that although Nokia strongly believed it could benefit from cooperation with others, policy of cooperation was based on carrying out its already defined innovation strategy, instead of also using knowledge of its partners in the process of defining its innovation strategy. The drive to cooperate with other firms to identify new directions for innovation is thus a 1: low drive. Within its policy on innovation, internal R&D played the major part with around 38 percent of personnel employed in R&D and R&D expenditure of 10 percent of net sales (Nokia, 2002).

In order to analyze the innovation strategy of Nokia itself, we shall first look at its broader future vision as stated in 2002. In this year, Nokia's vision was that over a period of roughly five years, the mobile phone industry would be characterized by fragmentation of products. This meant that Nokia thought that there would be very specific mobile phones that would suit the needs of a specific market segment. The main market segments Nokia addressed in its 2002 annual report were voice-centric, multimedia and enterprise businesses. In order to capitalize from this expected market development, Nokia's innovation strategy was based on diversifying its product lines with the use of new and improved technologies such as color screens, camera's as well as internet and multimedia capabilities to capitalize from these emerging market segments. Top management believed that with this strategy, it could successfully target the emerging market segments and improve on its already strong position in the market. A key part of this strategy was the development of a mobile gaming device, later known as the N-Gage. The idea behind this device was that it would be miles better suited to mobile gaming than any regular mobile phone, while still maintaining all functions a current mobile phone had to offer at that time. By releasing such a device before any of its competitors, Nokia had hoped to exploit a booming new market and gain a competitive advantage over all of its rivals. The innovation strategy however is rated of being of medium quality. As described, Nokia's innovation strategy relied heavily on hardware improvements in its mobile phones, thus concentrating less on improvements which could be made in the software aspect of its devices. This

imbalance in the focus of the firm's innovation strategy could potentially lead to devices with state of the art hardware, but being let down by outdated software.

During 2003, Nokia's top management team remained the same meaning that diversity between its members remained as it was in 2002. The scores for both dimensions of diversity as well as the mediator of task conflict thus remained unchanged. This translated itself into Nokia's future vision, innovation policy and innovation strategy which all remained largely the same. During 2003, Nokia continued to focus its strategy on releasing more mobile phones and further diversifying its product lines. As stated by Juha Putkiranta, a then senior vice president of Nokia's Mobile Phones division: *"… the provision of an extensive variety of devices means that the consumer is offered more choice and that there will be at least one that you will like*" (McCartney, 2003). This broad range of products would enable Nokia to capitalize from new growth markets such as India and China as well as the markets it was already active in such as Europe and the US. While consumers in new growth markets such as India and China were primarily interested in their first, cheap mobile phone, consumers in the 'old' markets in Europe and the US were interested in buying a replacement phone with additional value as compared to their old ones. Developing a broad range of mobile phones would thus enable Nokia to compete in each of these markets as it would offer mobile phones that would hopefully appeal to all market segments.

Throughout the year, Nokia launched several new phones which were indeed created to do just that. For Nokia's future vision, Nokia was very clear that it envisioned an industry in which mobile phones that would function exclusively as a telephone would be considered antique in a mere five years' time. This was outlined in its annual report where it stated that mobile communications, information technology and media industries were converging into a broader industry which Nokia called the mobility industry. For Nokia, it was key to its strategy to keep up with this convergence of industries and continuously deliver new phones that would offer new functionalities that were not found on mobile phones before. In order to be able to do this successfully, Nokia planned a reorganization of its business structure to be effective of January 1, 2004. The divisions would from then on be called Mobile Phone, Multimedia, Networks and Enterprise Solutions. However during 2003, it began to appear that its innovation strategy of the previous year did indeed contain some flaws. The N-Gage, the gaming deck which Nokia betted so heavily on, received some major critique in the press which could be traced back to flaws in its fundamental strategy. Due to flaws in the devices design and retail strategy it was both unattractive for retail stores to offer the device and its games, as well as for consumers to use the device as a mobile phone. Because of this, most target consumers would continue to use a separate mobile phone and a mobile gaming device instead of purchasing the N-Gage.

More general critique was given to Nokia about its overall strategic orientation. As it had been the previous years, Nokia's innovation strategy focused mainly on the hardware side of its mobile phones. While this had led to success in the past, concerns were now being raised by outsiders as well as lower ranked employees within Nokia about competition from Asian manufacturers. These new competitors had proved the world to be very capable of producing high-quality mobile phones which could match Nokia's phones in hardware features. Thus, according to analysts, Nokia should put more emphasis on developing the software of its mobile phones in order to keep its competitive advantage and its high global market share of 39 percent.

In the beginning of 2004, Nokia attempted to strengthen the firm by adding three new top managers and restructuring its organization. The addition of these three new top managers meant that relations-oriented diversity increased slightly to 2: medium diversity. More interesting though is the task-oriented dimension. With the new top managers coming from outside the firm and other industries, diversity in industry background, job background, firm tenure and top management team tenure all increased. The score for this dimension thus increased to 3: high diversity. These changes however did not affect the degree of task conflict within Nokia's top management team, as the degree of job overlap was the same as the two years before.

When looking deeper into the indicators of top management team tenure and firm tenure they seem to be interesting in Nokia's top management team of 2004. In this team, we see high diversity in these indicators but large gaps within this diversity, as displayed on the figure to the right. This means that, in theory, this could lead to sub-group formation as people with similar characteristics tend to relate closer to each other. In the case of Nokia's 2004 top management team, this could mean that the old and new top managers would form their own sub-groups within the top management team.

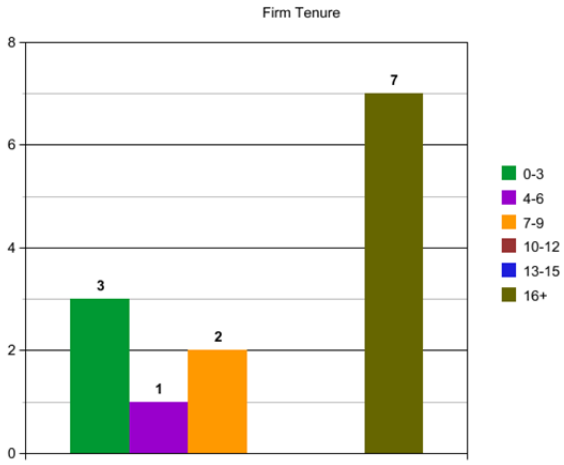



**Figure 4: Diversity in firm tenure in Nokia's 2004 top management team**

In the beginning of 2004, it looked like Nokia's innovation strategy was paying off. In the global market for smartphones, which are very feature-rich and expensive devices, Nokia was the clear leader. Because of this initial success, Nokia's short term innovation strategy remained focused on exploiting new technologies and improving existing technologies to capitalize from the market opportunities which mobile imaging phones and smartphones had to offer. For its long term future vision, Nokia concentrated on areas such as music, mobile games and mobile TV which it hoped could be integrated in its devices within three to five years. In order to pursue both its short term strategy and its longer term vision, Nokia started looking at outside firms more seriously for innovation development, thus adjusting its policy on innovation as it became more cooperation-driven. For this goal, Nokia Venture Partners was created which, according to Chief Strategy Officer Matti Alahuhta, would become a very important element in Nokia's overall innovation strategy. During 2004, Nokia formed a new 100 million dollar fund to invest in small mobile technology firms that had commercially available products and experienced significant revenue growth, with plans to invest even more money in 2005. Through this venture and other new cooperation plans, Nokia showed medium signs of drive for cooperation in its innovation policy.

During the year, more flaws in Nokia's innovation strategy became apparent. One of the areas of critique was indeed aimed at the way in which Nokia handled software development. While Nokia had previously been a very good performer in the hardware department its software development was not up to the standards of the current market needs, according to market analysts. What is striking is that Nokia had anticipated the competition on software, by stating in its annual report "*we*

*will compete at the level of software layers rather than solely at the level of products and solutions. Examples of such layers include operating system and user interface software, and application software, such as games software*" (Nokia, 2004). Nokia had predicted the entry of HP, Microsoft, Nintendo and Sony into the market, all companies with much more software development experience than Nokia. Yet, Nokia insisted do to the majority of the software development itself, rather than actively seeking cooperation with other firms more specialized in software development. As a veteran tech entrepreneur stated: "*Nokia has aspirations to be a successful software company, but I don't really get it. They are hardheaded hardware guys*" (Maney, 2004). Thus, it appeared that Nokia did not have the right mindset and/or capabilities to develop software that was on-par with that of its new competitors, yet insisted to do just that. More criticism fell on Nokia for the over-emphasis on developing ever more advanced, complex products. While Nokia was so keen on developing new, high-end phones with as much new technologies in them as possible, it did not pay enough attention to what was happening in the market place. Both of these areas of criticism can be traced back to Nokia's top management team. As the majority of Nokia's 2004 top managers had contributed to Nokia's tremendous success in the past, they were hesitant to make fundamental changes to the firm's future vision, its policy on innovation and the innovation strategy. Because of this virtually unchanged strategy, Nokia had failed to capitalize on new trends in mobile phone design, such as the regained popularity of foldable "clam-shell" mobile phones and the booming market for mid-priced phones with color screens. Nokia had stuck to its candy-bar design, which was once a great move but now appeared to look dated. In addition, with Nokia's strong focus on new technology development it had a line of products aimed at the high-end market, but failed to produce competitive phones for the more affordable mid-priced market. Thus the medium quality of Nokia's innovation strategy, due to the imbalance in the focus on the different product-aspects, led to a decrease of the firm's competitive position.

Due to the failure of Nokia's innovation strategy its top management team came under stress. As seven of the thirteen top managers of Nokia had been a part of Nokia's success during the late 1990's and early 2000's, they were inclined to keep heading in the same direction. As Nokia CEO Jorma Ollila stated in an interview with the USA Today newspaper in July 2004: "*The danger is you become complacent*" after having such an enormous amount of success as Nokia had before 2004. This thus means that, because of a feedback loop between innovation strategies of successive years, the indicators of top management team tenure and firm tenure do indeed have an effect on the mediating variables of future vision, policy on innovation and the innovation strategy. In this case, the people with high top management team tenure were inclined to stick closely to their decisions and strategies made in the past, instead of continuously reevaluating past strategies and redesigning them for the future. Because of this, many people from outside and inside the organization began to voice their desire of change within its top management team. The ones which were under the highest stress were Pekka Ala-Pietilä, Matti Alahuhta, Sari Baldauf and Olli-Pekka Kallasvuo, which were often referred to as "Jorma's gang" as they formed a close-knit group with Jorma Ollila ever since he became CEO in 1992. The reference to Jorma's gang reinforces the notion that large differences in top management team tenure can stimulate the formation of sub-groups within this team, which in this case has indeed had a negative impact on the innovation strategy defined by the top management team.

***2005-2007***

During 2005, Nokia again made some changes to its top management team. Due to the criticism on Nokia's top management team of 2004, some members decided to leave Nokia and pursue other opportunities which meant new people had to enter Nokia's top management team of 2005. While these changes did not significantly the score of either dimensions of diversity between the top managers, as the characteristics of the exiting top managers were very similar to those of the ones entering the top management team, it did decrease the chance of sub-group formation as the top management team diversity was now more evenly spread across the indicators. Therefore, in theory, Nokia's 2005 top management team could experience less struggle within the process of strategic decision making. These new changes also slightly affected the degree of task conflict within Nokia's new top management team. Through these changes, eight out of the total number of twelve top managers were now partly concerned with innovation in the firm's mobile phone department.

With the criticism from 2004 fresh in mind, Nokia made some revisions to its innovation strategies in hope to regain some of the market share it had lost in 2004. Looking at the markets Nokia was active in, its top management stressed the importance of cheap and simple mobile phones for the high-growth markets in countries such as China and India, while expensive, feature-rich devices were key in the replacement markets in Europe and The US. In order to reestablish its dominant position in Europe and The US, Nokia created two new mobile phones lines: The E-line aimed at business users and the N-line aimed at the young, multimedia user. For each of the specific lines, Nokia developed new features which would hopefully entice consumers to buy the firm's devices. However, Nokia had seemed to have learned from its mistakes made earlier when it came to software development. With the fresh perspective of Tero Ojanperä, Nokia's new Chief Strategy Officer, Nokia announced several new partnerships with other firms in order to develop new and compelling software features to incorporate in its future range of mobile phones. These newly formed partnerships thus show how an increase in top management team tenure with a fresh CSO has enabled the top management team to examine its own policy on innovation and innovation strategies critically, and make adjustments accordingly. In this example, Nokia's top management team seemed to benefit from this increase in diversity.

Despite the increased drive for cooperation with other firms, the role of internal R&D remained high for Nokia with approximately 10 percent of net sales invested in internal R&D and 36 percent of the total number of employees (Nokia, 2005). As these numbers have remained virtually unchanged since 2002, this indicates that the increased drive for cooperation in the firm's innovation policy is seen as an addition to internal R&D, instead of a replacement.

Even though Nokia made some strategic changes during the year, criticism on some of Nokia's longest sitting top managers remained. Therefore, three top managers stepped down at the end of 2005 and were replaced by others to form the 2006 top management team. These top managers were Jorma Ollila, Pekka Ala-Pietilä and Yrjö Nuevo, who had all been part of the top management team from at least 1993. Probably the most striking change to Nokia's top management team of 2006 was the departure of Jorma Ollila, who had been CEO of Nokia since 1992. Due to the changes made to Nokia's top management team, diversity in firm tenure and top management tenure actually decreased. This caused the overall degree of task-oriented diversity to decrease to 2: medium diversity. The indicators for relations-oriented diversity however remained virtually

unchanged, thus the score of 2: medium diversity remained. Because of these changes however, task conflict decreased by a fraction as there was now one less top manager concerned with innovation in the firm's mobile phone division.

As Jorma Ollila faced increasing criticism on his views on the industry and the firm, he decided to step down and let somebody else take charge as CEO of the firm. To find a suitable successor, Nokia looked at several internal employees which had already served in the top management team. In the end, Olli-Pekka Kallasvuo, who had been with Nokia since 1980 and had been part of the top management team since 1990, was chosen to become the new CEO. By choosing someone with such a long career within the firm, Nokia adhered to its existing corporate culture which stimulated long-time service within the firm. The rest of Nokia's top management team thought that with Mr. Kallasvuo as the new CEO, people within Nokia would feel good about Mr. Ollila leaving the firm and more importantly, having someone with intimate knowledge of the firm would allow for continuity as Mr. Kallasvuo was very aware of Nokia's internal organization and operations. Outsiders and market analysts though did voice criticism on the appointment of Mr. Kallasvuo as CEO though. Most of them feared that with Mr. Kallasvuo being a long-time Nokia employee, the firm would just continue business as usual instead of making the fundamental changed they thought were necessary for Nokia to remain ahead of its competitors in the future. When Mr. Kallasvuo indeed became Nokia's new CEO in June of 2006, he gave several interviews and presentations in which he voiced his views about Nokia and his vision on the market as well as the future. Very important to him was the exploitation of different market segments which had started to emerge not much earlier. As he stated on his vision on how Nokia should position itself to recapture its market share: "*It is not a question of one iconic product; it is a question of many iconic products and that relates to the segmentation of the market place*". Therefore, he believed that Nokia should further concentrate on its business centered E-line mobile phones, its multimedia centered N-line and perhaps add new product lines that would target different market segments. In order for Nokia to offer the best possible choice to the consumer, Mr. Kallasvuo believed that its innovation policy should be more cutting edge as compared to the previous years. As stated earlier in a press conference, Nokia "*has to lead the change and not be a follower*" (Timmons, 2005) and should therefore be on the forefront of innovation in the mobile phone industry. An example which resulted from this view was Nokia's investments in Mobile Augmented Reality. With this technology, consumers could use their camera-equipped mobile phones to obtain information about their surroundings in real-time. A second example of Nokia's heightened desire to be on the forefront of innovation was its new partnership with Motorola. While Nokia had already invested in technologies surrounding mobile television, it now engaged in a new partnership with Motorola to co-develop and


**Figure 5: Augmented Reality on a mobile phone**

promote the DVB-H technology to become the new standard in mobile phone television broadcasting.

In the following year, diversity within Nokia's top management team remained stable as no further changes were made to the team. When Nokia reported some very strong results on the previous year, CEO Kallasvuo responded that "*it could and should have been better. We are looking for ways to continue to improve our business*" (CNET, 2007). Therefore, the top management team continued its effort to come up with innovation strategies that would, if executed properly and timely, result in a competitive advantage for Nokia and in turn increase its sales numbers and profits even further.

An important part of this innovation strategy was the mobile gaming market. While this specific market segment had been proven very difficult to crack for Nokia with the failure of its N-Gage device, Nokia remained convinced that mobile gaming could prove very profitable. However, it learned from the mistakes it had made with the development of the N-Gage gaming device. Nokia's latest mobile gaming efforts now concentrated on developing a software platform which would be incorporated in its high-end Series 60 mobile phones. Through this software platform, for which Nokia re-used the name N-Gage, users could download advanced mobile games directly to their mobile phones. This approach would solve most of the problems of the earlier N-Gage device, as Nokia's current mobile phones were much more user-friendly and did not have the same design flaws as the first N-Gage released by Nokia in 2003.

Very much in line with Mr. Kallasvuo's comments on the need for Nokia to create differentiated product by using new technologies, Nokia saw market opportunities in GPS enabled mobile phones. These mobile phones enabled users to view their current location on a downloaded map and use their mobile phones as a navigation device. In order to target this 'navigation market segment' as successfully as possible, Nokia developed a new product line called the Navigator series in which mobile navigation was the key feature. However, plans were also made to incorporate GPS technology in a range of its more expensive E-line and N-line mobile phones.

One of those high-end N-line mobile phones was the N95 which was released in April 2007 in Europe. This 'flagship' mobile phone which was developed during 2006 when Nokia renewed its focus on cutting edge innovation, incorporated the latest technologies on GPS, camera, multimedia, internal storage, smartphone capabilities and the N-Gage gaming platform. This highly successful mobile phone was the product of Nokia's high-quality innovation strategy, in which it did not focus solely on the hardware on the device, but rather seek improvements on all aspects relevant to the user experience which included the overall design and the software as well.

To enable itself to remain competitive in the new market segment of navigation devices in the future, Nokia announced in October 2007 that it acquired Navteq, one of the two biggest producers of digital maps worldwide.

The enormous success of the N95 mobile phone and other mobile phones developed within this new, high-quality innovation strategy helped boost Nokia's global market share back to an astounding 38.6 percent. However, as had been proven in Nokia's recent history, such success can often lead to over-confidence and perhaps even arrogance. While the Symbian operating system had played a large role in Nokia's success over the years, not a lot had changed to the operating system itself. However as there had simply been no real competitive operating systems, the need for innovation on the

operating system level had been very low for Nokia. During November 2007 however, Google announced the Open Handset Alliance, which included 35 firms such as T-Mobile, China Mobile, Samsung, Motorola and Intel. These firms would work together to create and support a new mobile operating system called Android. This open source operating system could very easily be used by mobile phone producers, who could give their own twist to the user interface but would have instant access to a vast database of software applications and not have to worry about the development of the operating system itself which would be done by Google. Nokia, however, did not want to be part of this alliance or use Android. Olli-Pekka Kallasvuo who was unimpressed by Android responded to Google's announcement by saying "*conceptually, we could have made that announcement a long time ago*" (Landler, 2007). In his view Android could not bring any real benefits to a mobile phone producer like Nokia, which is why Nokia decided not to change its future vision and to stick with Symbian for the coming years.

### *2008-2010*

In 2008, Nokia did some restructuring to its divisions in an attempt to speed up the development process of its mobile phones. During this restructuring however, only one change was made to Nokia's top management team with the departure of Pertti Korhonen and the addition of Niklas Savander as head of the Services & Software division. When looking at what this change meant for the diversity, it appears that relations-oriented diversity scored a 2: medium diversity in 2008 as it did before. As for the task-oriented diversity however, the score increased to 3: high diversity due to Mr. Savander's extensive experience in software development in the computer industry.

Even though the addition of Niklas Savander to the top management team might look minor and did not affect the high degree of task conflict, it did have significant effects on Nokia's top management team and its strategic decisions. As head of the Services & Software division, he stressed the need for Nokia to develop a whole 'ecosystem' of services around its mobile phones to enhance the user experience of these devices. Inspired by this vision, Nokia announced the Ovi brand, an online platform which would offer a vast range of functionalities to Nokia's latest mid and high-end mobile phones. Additionally, it announced plans to buy the open-source mobile firm Trolltech. The acquisition of this firm would enable Nokia to accelerate its software strategy and develop its internet services business. During the year though, disappointment hits Nokia when its announces decreased profits and plans to cut jobs in an effort to bring down expenses. At the same time, many outsiders to the firm openly criticize Nokia's top management as the firm falls behind in the latest technological developments. With the Apple iPhone, released in 2007, being a huge hit, people criticize Nokia's management for its apparent inability to come up with a compelling answer to the iPhone. As became apparent during 2008, Nokia had already developed a mobile phone with a touchscreen, a feature which made the iPhone so popular years earlier, but top management decided to scrap the project as it was deemed too risky. This strategic decision now affected the firm in a negative way, as this once pioneering firm was now lagging behind new competitors. In an effort to step up its competitive position, Nokia increased its focus on internal R&D with investing 12 percent of net sales in R&D projects and but with a decreased work force of 31 percent of employees involved in this department (Nokia, 2008).

2009 proved to be a difficult year for Nokia. In the beginning of January, the firm had to report a 69 percent drop in profit of the fourth quarter of 2008 as compared to a year earlier. While this was

largely attributed to the global economic downturn, it was clear Nokia had to make fundamental changes to its policies and strategies in order to face this time of trouble. One of the ways in which the firm thought it could drastically improve its product offering was by extending the Ovi service with an application store. While competitors had already been offering services through which consumers could download new applications directly to their mobile phones, Nokia could not offer such service for its mobile phones. Therefore, it decided it would invest significantly in the development of its own online application store. In addition to this, Nokia's top management team decided it should radically change its policy on innovation. While it had already engaged in several partnerships to develop software in the recent years, those partnerships did not yield much concrete results. Instead those cooperations were mainly used to explore new ideas about developments which could be used in products in five years' time or even more, thus as input for the firm's long term future vision. However, new partnerships had to be formed that could be used directly in the firm's shorter term innovation strategy by providing direct competitive advantage. As admitted by CEO Kallasvuo: "*We need to be open to change, we have to work with competitors and our partners in different ways than we have done in the past"* (Top News, 2009) signaling the realization that continuing Nokia's old policy on innovation would bring further trouble for the firm.

One of these new, more active partnerships was announced in May. Nokia would work closely together with semiconductor chip maker Intel, to develop new hardware as well as software that would enable Nokia to develop a whole new range of devices, very much in line with Nokia's innovation strategy of diversifying its product lines and offering very differentiated products to the market.

Nearing the end of the year though, new results came in aggregating the sales results of mobile phone producers. Unfortunately for Nokia, its share of the smartphone market had dropped 15 percent as compared to the previous year. In a respond to this bad news, Nokia announced new plans that would radically break with its past. While its previous strategies had been so much focused on developing ever more differentiated products to the market, Nokia's top management team now decided this was actually part of the firm's problems. Due to the increasing importance of software within the mobile phone industry, having a great number of different product lines actually complicated the process of developing competitive software for each of these products. Therefore, this innovation strategy which was once of high quality was now of significantly lower quality due to changes in the industry. By reducing the number of smartphones for the next year in half, it could put more research and development in the products it would actually put out and through that offer products with a higher degree of competitiveness.

At the beginning of 2010, Nokia created a new division called Solutions which focused on the very high-end mobile phones. Through the creation of this new division and new top management position, the degree of task conflict increased further as eight of the total twelve top managers had clearly overlapping tasks, all dealing with innovation in mobile phones. Alberto Torres who had been working for Nokia for five years was appointed as head of the new division and as a new member of the top management team. Mr. Torres' had extensive experience as a management consultant, having at the McKinsey consulting firm for over ten years. Even though he had no prior experience in the mobile phone industry, Nokia's top management believed his strategic insights could change Nokia's fortune and reestablish its position in the mobile phone industry.

As for the firm's policy on innovation, its partnership with Intel provided top management with new insights as to how a new operating system could be developed with the needs of high-end costumers better in mind. To develop such an operating system, Nokia and Intel would work together to merge two of their existing operating systems into one, called MeeGo. MeeGo would then be used to power future high-end products of both Nokia and Intel. Several months later, Nokia announced that MeeGo would replace long-term favorite Symbian as the platform for all of Nokia's future smartphones as the new operating system provided the firm with an easier, better platform for future software development.

This new strategy however did not change Nokia's short term problems. With profits and market share declining, rumors began to emerge that Nokia was looking for a replacement for CEO Olli-Pekka Kallasvuo. Anssi Vanjoki, another Nokia veteran employee, was seen as the logical successor to Mr. Kallasvuo. However, in September of 2010, the firm announced outsider Stephen Elop to become Nokia's new CEO. Mr. Elop had previous experience of managing divisions during times of substantial change, which would hopefully enable him to draw a successful plan for Nokia's future. Additionally, as an American he understood the US market, which has been traditionally difficult for Nokia to compete successfully in. This understanding of this important market was hoped to increase the firm's ability to grow in the US. Also, with his previous employer being Microsoft, Mr. Elop had important working experience in a software-dominated industry and had already gotten to know Nokia through cooperation between the two firms. Because of these reasons, Mr. Elop was seen as the right person to lead Nokia into a new and profitable direction for the future. Despite his useful industry background and job experience, some people from within the firm criticized the appointment of Mr. Elop as the firm's new CEO. As they mentioned he had no previous working experience in the mobile phone industry, which they feared meant that he probably did not understand the industry and the complex value chain enough to make the right strategic decisions.

Some time after joining the firm, Mr. Elop commented on Nokia's inability to be successful in the US market. As he stated: *"We were trying to run a business globally and not tailoring enough for the U.S"* (CNET, 2010). What he meant with this was that, although Nokia produced a great range of mobile phones, it did so from an inward looking perspective, developing mobile phones they themselves thought the consumers would want. However, according to Mr. Elop, Nokia should have developed mobile phones very specifically for certain target markets, instead of releasing all of its mobile phones globally. Also by developing mobile phones for a specific market, Nokia could work together with network operators in those markets to make sure the mobile phones would fit the consumers' needs. As stated by Mr. Elop, Nokia's previous top management team lacked this understanding of the US market and therefore did not succeed in developing products that would be successful in the US. Diversity in the sense of diverse knowledge on the different markets Nokia was active in could therefore have helped the top management team in defining the right innovation strategies. However as Nokia's top management teams had been so European-oriented, they lacked the knowledge on the right aspects that were needed to make each mobile phone a success in a specific market.

## *5.1 Influence of the moderators*

In the previous pages, Nokia's top management teams during 2002-2010 have been discussed as well as the innovation strategies defined by them, and how these strategies were influenced by diversity

within these teams. The moderators as presented in chapter 3.2.4 however are thought to have influenced the relationships between the diversity, the mediators and the innovation strategy. Their influence will therefore be discussed briefly in this paragraph.

### *Communication*

From this first within-case analysis, we can see how the moderating variable of communication can be linked to the indicators of diversity as well as its effect on the mediating factors and the innovation strategy. For example, in the beginning of the timeframe in this research, communication was open between Nokia's top managers meaning they shared their views of the firm, the industry and strategic options easily with one another. However, as uneven spread of diversity in top management team tenure and firm tenure led to sub-group formation, this had a profound and negative effect on the communication within Nokia's top management team. As these sub-groups formed, several top managers started communicating less to those top managers who belonged to the different sub-group. As a result, the knowledge possessed by the different top managers was not shared throughout the entire top management team. This started forming a barrier in the strategic decision making process, negatively impacting the future vision, policy on innovation and innovation strategy as defined by the top management team.

### *Competence-based trust*

Evidence for the effect of competence-based trust can also be found in the analysis of Nokia. During the first years of the analysis, many of Nokia's top managers had been promoted through the ranks of the firm. They had therefore proved their competence and their ability to make the right strategic decisions and leadership skills. Thus, because firm tenure of most top managers was rather high, competence-based trust in them was high as well. However, we can also see how the specific job and industry background of the individual top managers is related to the degree of competence-based trust they receive. When Olli-Pekka Kallasvuo took over as CEO after Jorma Ollila resigned as CEO, people feared Mr. Kallasvuo was not up to the job. Even though he was a Nokia veteran, he was seen as 'just a lawyer' due to his job background, causing people to raise questions to his ability to lead such a high-tech firm as Nokia. A similar example can be seen when Stephen Elop became Nokia's CEO in 2010. People feared that, with his former employer being Microsoft, he would be too positive towards a possible takeover by Microsoft. His background thus was the direct cause for a lower degree of competence-based trust when he joined the firm.

### *Power struggle*

Very much related to the above two moderators is the moderator of power struggle. In this case we indeed see signs of power struggle when looking deeper into the analysis given on the previous pages. Especially in the early years, 2003-2004, we see evidence of power struggle due to the formation of the different sub-groups in Nokia's top management team. As the long-sitting top managers, referred to as "Jorma's gang", had been part of the firm's top management team for a long time and were directly responsible for a lot of its success, they were inclined to stick closely to their future vision, policy on innovation and innovation strategies that had brought them this success. Some of the newer top managers, though, noticed the market was changing and urged to firm to take strategic decisions accordingly. However as the most powerful top managers, "Jorma's gang", decided to make little changes, the two sub-groups began to struggle in their search of more

strategic decision making power. This struggle, however, in turn negatively influenced the strategic decision making process as the two sub-groups could not reach consensus on the innovation strategies needed to sustain the firm's success.

## 5.1 Summary of the analysis

In this short section, preliminary answers to the empirical questions will be given on the basis of the analysis of Nokia over the period 2002-2004. As Nokia's innovation strategy had proved so successful in the late 1990's and early 2000's, it is striking to see how Nokia's dominant market position began to slip later on. The biggest reason for the declining success of Nokia's innovation strategy was that it was designed from a very inward-perspective. This means that instead of looking at the demand of consumers and/or developments of competitors, Nokia's innovation strategy was mainly influenced by its previous strategies and its own internal development programs. The main reason for this lack of strategic-reevaluation came from the way in which Nokia appointed its top managers.

Nokia traditionally stimulated long-service and promoted employees over the years. Most of Nokia's top managers therefore came from within the firm. While that did provide them with intimate knowledge of the firm itself and the industries it was active in, it generally decreases the likelihood of the top management team to question the fundamentals of the firm's strategies. Especially since these top managers had been such an important part of Nokia's success just years earlier, they had become smug with their own success and did not take outside threats seriously enough. The high top management team tenure and firm tenure of Nokia's top managers from the beginning of this research thus formed a barrier in their ability to make the right strategic decisions.

In addition to the imbalance that existed between the top managers of Nokia's different top management teams, sub-group formation within the top management led to a decrease in communication among top managers and an increase in power struggle. This resulted in a negative effect on the strategic decision making process within the top management team, which meant the future vision, policy on innovation and innovation strategy of the firm were not defined and evaluated quickly and/or efficiently, which is all important in a rapidly-developing industry such as this.

We can also look at the indicators of industry experience and job experience of the different top managers to find reasons for Nokia's turbulent recent history. While diversity in these indicators might have been high at times, this did not necessarily benefit the firm. When looking at the mobile phone value chain, as pictured in figure 1 in this report, we see that this value chain has become increasingly complex during 2002-2010. Within Nokia's top management team's however, little experience in the sense of software development existed as no single top manager had extensive experience in a software-oriented industry or specific job. This thus means that as the software aspect of mobile phones became increasingly important, knowledge of this subject was lacking within Nokia's top management teams. Even the degree of task conflict, which was high during the entire nine years of this research, could not lead the top management team to define successful innovation strategies due to this increasing lack of important knowledge within Nokia's top management teams.

Because of the problems described above, Nokia's top management team had been unable to rewrite its long-term future vision, its policy on the way it viewed and used innovation as well as its

short term innovation strategies. Because of this, the firm continued along very similar innovation strategies as it had done in the past. While these strategies may have been of high quality in the past leading the firm to success, changes in the industry demanded different innovation strategies from mobile phone producers which meant Nokia's innovation strategies decreased in quality as they did not fit the industry developments.

Despite all of the changes made to Nokia's top management team during 2002-2010, they thus seemed unable to create a top management team with extensive knowledge on the entire mobile phone value chain and positively stimulate useful task conflict in order to secure the firm's success for the future.

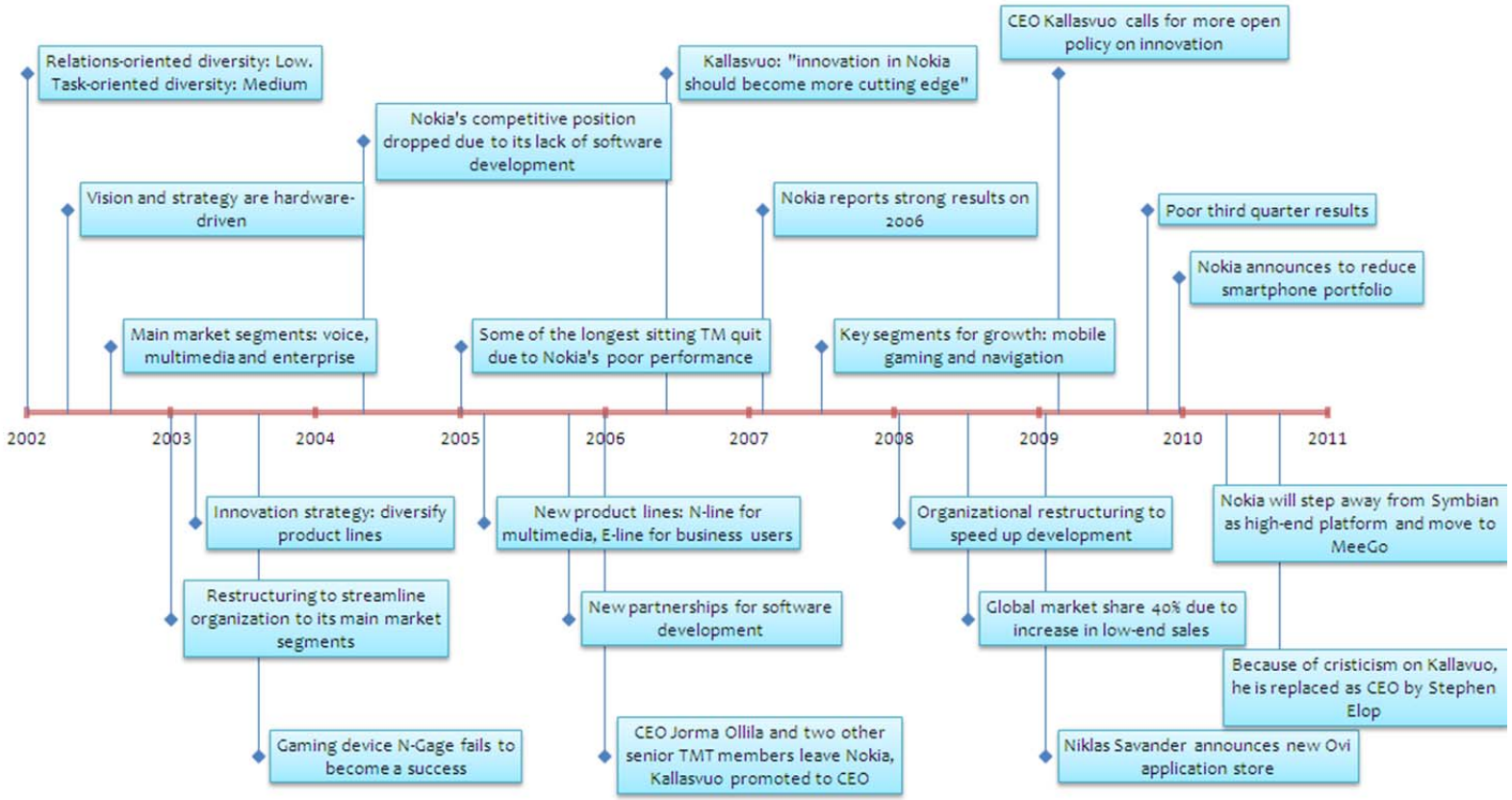



**Figure 6: A timeline showing important events for Nokia between 2002-2010**

# 6. Case 2: Motorola

The case of Motorola is the second case which will be analyzed in this report. As with the first case, data has been collected using newspapers, websites, annual reports and presentations. In total, 90 documents have been gathered for Motorola to analyze all of the important variables for the period 2002-2004. For the rest of this chapter these variables will be discussed and possible connections between them will be identified. As for the previous case, a timeline showing some of the most important events for Motorola between 2002 and 2010 will be presented on page 57.

**Control variables**

As for the case of Nokia, the control variables for Motorola will be discussed briefly in order for the reader to get a deeper understanding of Motorola as a firm.

Motorola, being founded in 1958, like Nokia has developed itself into a telecommunications giant over the years. Unlike Nokia though, Motorola had been much less focused on the production of mobile phones. In fact, Motorola showed a much higher sign of diversity in industry activities as it was also active in the semiconductor industry, commercial, government and industrial communication equipment, the broadband communications industry, as well as vehicular electronic systems. The score attributed to the control variable of diversity in industry activities is thus 2: medium diversity. In order to develop, produce and market products for all these industries Motorola had around 97.000 employees in 2002. Unfortunately for the firm, it had a very rough year with the annual report stating an annual net income in 2002 of $-2.480.000.000 (Motorola, 2002). Because of this very negative result, Motorola's top management team had its work cut out for itself in trying to find ways to return the firm to profit during the following years.

### *2002-2004*

At the beginning of 2002, Motorola found itself in a troublesome situation. The firm had not been profitable the last few years and serious action needed to be taken in order to address the situation. In order to do so, it had made significant changes to its top management over the last few years and had an overall strategy which mainly focused on aggressively cutting manufacturing costs while at the same time pursuing growth through innovative products, software applications and customer relationships. Motorola had stressed in its annual report and it should constantly evaluate its strategic options and business portfolio, as well as continuously strengthen its top management team in order to return the firm to profit. During 2002, the top management team consisted of fourteen people.

The following section will shortly discuss the diversity between these top managers, with graphs per indicator being included in appendix 3. In order to assess the relations-oriented diversity, we must again look at the indicators of gender, country of birth and ethnicity. As for the gender indicator, all fourteen top managers of 2004 were male meaning that there was no diversity in this indicator. As for the ethnicity, thirteen of the top managers were born and raised in the US while only one, Bo Hedfors was European as he lived all of his live in Sweden before joining Motorola in the US. The final indicator, year of birth, shows a larger diversity however. While the oldest member of the team was born in 1940 and the youngest in 1966, the rest of the top managers were spread relatively even in between that time period. The overall score attributed to the dimension of relations-oriented diversity is therefore a 1: low diversity. As explained above, Motorola had deliberately made significant changes to its top management team over the years. This means that average top

management team tenure was relatively low, with the longest person, CEO Chris Galvin, being there for nine years in 2002. As the other thirteen top managers had all been part of the top management team for six years or less, diversity on this indicator is low.

A very different picture shows the last indicator: firm tenure. As many top managers were replaced over the years, many of them were not only new to the top management team but also new to the firm. What the graph to the right clearly shows is that there was a big gap between how long each of the top managers has been with the firm. While one half of the top management team was relatively new to the firm with only being there for a handful of years, the other half of the team had been with Motorola for well over a decade and a half. In fact, of the six top managers who have been depicted in the graph as being there for over seventeen years, five of them had been with Motorola for over 25 years. So, the diversity of firm tenure of the top management team of 2003 was very high. However, due to the big gap in firm tenure of the top managers, a struggle in power or sub-group formation is not unlikely. The indicator of industry background showed medium signs of diversity for Motorola's 2002 top management team, since most of the top managers had an extensive career within the telecommunications industry. The fourth and final indicator, that of job background, did show a high degree of diversity as each of Motorola's top managers had years worth of experience in their specific lines of work. Combining the four indicators of the task-oriented diversity dimension, the overall score for the dimension is 2: medium diversity. In Motorola's top management team though, there was a low degree of task conflict between the top managers. Each of the fourteen top managers had a clearly defined and very specific task, due to little overlap in job descriptions. This could thus negatively influence the degree to which Motorola's top management team could make effective use of the diversity that existed within the team.

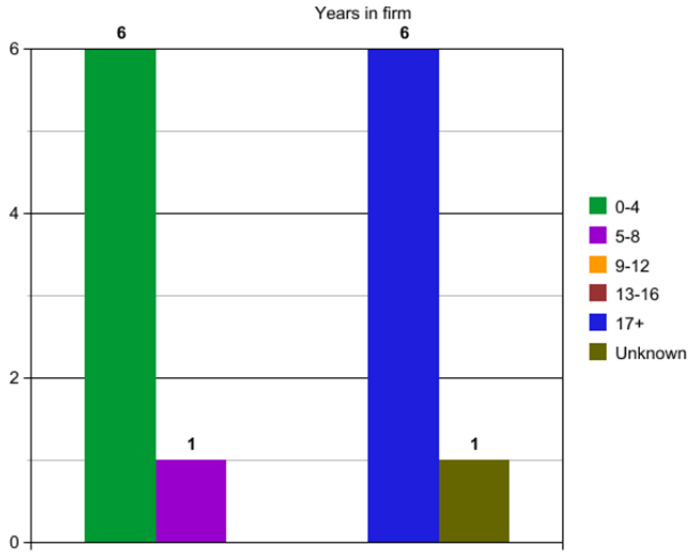



**Figure 7: Top management team tenure for Motorola in 2002**

As already stated, Motorola's overall strategy was heavily focused on reducing production costs in order to increase the profit margin on every phone sold and in turn achieving a profitable year in 2002. A big part of this strategy was to develop new generic platforms to be used for the production of its mobile phones. While Motorola used to have a dozen of platforms for its phones, this production process had become too costly and complicated to maintain. Thus, by declaring this self-claimed war on complexity, Motorola started development of three new generic platforms on which its future phones were to be based. This was a radical break from its old approach in designing mobile phones, and was facilitated by the fresh perspectives provided by the newcomers of Motorola's top management team. During the year, Motorola decreased its R&D expenses to 14 percent of net sales with around 39 percent of employees in involved in R&D (Motorola, 2002).

The strategy of developing generic platforms paid off during 2002 as the production costs were cut significantly and the business returned to profit. However, the development of such platforms was not the only break Motorola tried to make with its past. Another shift in innovation strategy focus came from Motorola's future vision of the market. As stated by Motorola, it believed that mobile phones would become commodities within four years time meaning that the basis of competition would shift away from technology, which it had been over the last years, to something else. This new vision for Motorola had several effects on its innovation strategy. First of all, Motorola decided to start licensing some of the technologies it had developed to other firms, among which competitors in the mobile phone industry. After all, with competition moving away from technology in Motorola's view, licensing its technology would not harm its competitive position. However as a result of this new view, Motorola had to find a new basis of competition. It saw the factors of brand, distribution and style as important factors which would drive the competition in the mobile phone industry in the future. Because of this, Motorola started to put more emphasis of the design of its phones in its innovation strategy. Design however was not the only area on which Motorola started to put more emphasis on in its strategy on innovation. As hardware was becoming less important as a sales-driver in Motorola's view, it started to focus more on the software side of its products. As stated in an interview by the then vice-president of Motorola's Strategy and Development department: "*We do think an increasingly important part of staying competitive (in mobile phones) is around the software. It comes down to how you can deliver a more differentiated user experience, instead of becoming a commoditized device, and software is part of that*" (Daniel, 2002). So in order to stay competitive in a market in which the software was becoming increasingly important, the realization began to emerge that software development needed to become at least as important as hardware development in its innovation strategy. In order to do so, Motorola decided it would need to focus on a smaller number of software alternatives instead of working with most of the alternatives available as it did in the previous years, which it would have "nailed down and executed" in the following year.

During 2003, some changes were made to Motorola's top management team in order to come up with even better strategies both on the short term and for the future. Even though some changes were simply existing top managers switching positions, there were also some new additions to the top management team. As for the diversity, no big changes occurred during 2003 as compared to 2002. Relations-oriented diversity remained stable at 1: low. The dimension of task-oriented diversity was also unchanged as compared to 2002. While the absolute diversity did not change, the spread of diversity was more concentrated around a certain point. For instance, while the top manager with the highest top management team tenure stayed within the team, the arrival of new top managers shifted the balance of the diversity more towards a lower point. The score attributed to the dimension of task-oriented diversity for 2003 was therefore 2: medium diversity.

Performance-wise, 2003 was a difficult year for Motorola. While it had made significant changes to its future views and innovation strategies during 2002, it still felt the pain of bad innovation strategies of the past. With competitors launching new mobile phones with advanced features such as color screens, camera's and multimedia messaging, Motorola could not come up with a timely answer. Business analysts blamed this on Motorola's policy on innovation, which analysts felt was too conservative. With competitors heavily focusing on adding new features through using new technologies, Motorola's technological developments had focused mainly on the improvement of already existing and used technologies. As these analysts claimed, much of Motorola's conservative

approach to innovation could likely be attributed to the debacle that was the Iridium project. During the 1990's, Motorola had the vision of developing the first truly global communication network through the use of 66 satellites in orbit around the earth. The project took billions of dollars of investments over the years, however failed to attract enough customers eventually leading to the bankruptcy of the Iridium spinoff in 1999. From that point on, Motorola's top management teams, some of whom were still active in 2003, took a more conservative approach to technological innovation in order to prevent such Iridium-like catastrophes from happening in the future. Unfortunately, this conservative approach to innovation itself was now the cause of trouble for Motorola. Especially painful for Motorola was the speech given by CEO Chris Galvin on the CTIA Wireless convention where he stated that the industry should "*go back to basics*" by focusing on improvements of their chief product: voice calls. While improving the core functionality of a product is never a bad thing, competitors of Motorola saw a huge boom in their sales numbers, caused largely by the development of new phones in which making voice calls was just one of the many functions. Galvin's statement caused a great uproar among business analysts and investors, raising serious questions as to the strategies and market views of Motorola.

Critique also came from within the firm itself when Thomas Lynch, head of the Personal Communications department, stated that Motorola should increase its product range and be sure to incorporate the latest trends in their mobile phones. As a result, Motorola announced an all-color screen mobile phone lineup of which several were smartphones, in which many new features would be incorporated. In order to develop and support these phones successfully Motorola decided to increase its drive for cooperation with other firms, especially to ensure a high quality and attractiveness of the software incorporated in the devices. For this goal, Motorola engaged in new partnerships with, among others, IBM, Microsoft and MonteVista to develop new smartphones using both the Linux framework for sales in China, as well as smartphones based on Microsoft's Windows Mobile to target the business market segment which was very new for Motorola. In order to ensure the support for their smartphones, Motorola set up Moto-code in order to handle relationships with third party software developers and provide them with free tools to develop software for the smartphones. However, in September of 2003, CEO Chris Galvin decided to step down as he stated that the top management team and he did not "*share the same view of the company's pace, strategy and progress at this stage in the turnaround*"(Tatge, 2003). As his replacement, Ed Zander joined Motorola in December 2003 after coming from Sun Microsystems, a firm in the computer industry. The choice for Zander, an outsider to Motorola, was made deliberately as the top managers believed Motorola needed a fresh, different approach and that Zander could offer the kind of leadership that Motorola had been lacking.

In the following year, Motorola again made some changes to its top management team. The biggest and most important difference as compared to 2003 was of course the position of CEO which was held by Ed Zander in 2004, replacing Chris Galvin who had held the position since 1993. With the addition of Ruth Fattori and Padmasree Warrior to the top management team, the relations-oriented diversity dimension increased to 2: medium diversity due to an increase in the indicators of gender and ethnicity. The second dimension, task-oriented diversity, remained unchanged. With Ed Zander replacing Chris Galvin as CEO, and the addition of the new top management members from outside the firm, both the top management team tenure and firm tenure indicators decreased slightly. The other two indicators, industry background and job background, however increased due to the new

top managers which had clearly different functional backgrounds as compared to Motorola's top managers who were already part of the team. With two of the indicators decreasing in diversity and the other two increasing, the overall score for this dimension remained at 2: medium diversity. These changes however did not affect the degree of task conflict between the top managers. As they continued to have such distinctive tasks, the degree of task conflict was still low.

After the troubling year of 2003, it was clear that new changes had to be made to Motorola's strategies in order to increase performance in 2004 and secure its market share as second largest mobile phone producer worldwide. Fresh CEO Ed Zander wasted no time in expressing his visions and plans for Motorola's future. As he said, his biggest challenge lied in the culture of Motorola. This culture had revolved around always doing the right thing, but had become characterized by bureaucracy, inward-looking politics and caution. Part of this, analysts said, was still due to the decisions made after the failure of the Iridium project. Therefore, Ed Zander saw it as his biggest challenge to "*build on the culture and add a sense of urgency, speed, execution, customer focus*"(Maney, 2004). As for customer focus, his vision was clearly different than that from ex-CEO Chris Galvin.

Zander urged the development of more sophisticated mobile phones, stating that consumers wanted a single wireless device that is a phone, an e-mail gadget, an MP3 player and a camera. His background in the computer industry led him to believe that future mobile phones would gain ever more functionalities, to finally deserve the term 'mobile computer'. Because of this vision based on his previous experience his vision for Motorola was clear: develop devices that can do it all. Also part of his vision was to develop a broader range of target consumers, with special importance given to enterprise customers. In order to do this, Zander stressed the development of new services as part of the innovation strategy, specially designed to suit the needs of business users in for instance the handling of secure data. A big influence in this view was his past working experience at Sun Microsystems, where he was responsible from the software development division from 1999. Motorola should, in his view, focus more on software development to introduce new, compelling features in its mobile phones that would attract specific consumer segments.

Motorola's innovation strategy of concentrating more on design as decided in late 2002 had finally begun to pay off. With the launch of the Razr V3, often referred to as "Razor", Motorola had a big hit. The Razr's ultra-slim styling and unique look gave it tremendous appeal to the fashion-conscious customer. In fact, the Razr had proved so popular that it was in short supply in the US and secondhand Razr's were sold for a premium price on online auction website eBay.com. With its sights set for innovation in design and new, value-adding technology in the eyes of the consumer such as Wi-Fi and Bluetooth, Motorola had apparently made a clear break from its conservative approach to innovation of just a few years ago.

### *2005-2007*

Compared to Motorola's top management team of 2004, little changes were made in 2005. In fact, with the departure of Mike Zafirovski and Edward J. Fitzpatrick, as well as the spinoff of its Integrated Electronic Systems Sector, Motorola's top management team decreased in size to twelve members in 2005. The changes made however did not significantly affect the degree of diversity between the top managers or the degree of task conflict between them.

In the beginning of 2005, Motorola kept to the same cooperative policy on innovation as outlined before. As it saw Wi-Fi technology as a great opportunity for future mobile phone functions, Motorola decided to join forces with a dozen high-tech firms to develop a standard called Unlicensed Mobile Access which would allow Motorola to develop more affordable Wi-Fi capable mobile phones. In addition, Motorola and Skype signed an agreement to incorporate the popular Skype internet phone software on some of Motorola's mobile phones to enable users to make calls through their Skype profiles when using Wi-Fi networks. These two examples are clear indications that in order to carry out its innovation strategies, Motorola's policy was to increasingly work actively together with other firms to co-develop both hardware and software to deliver a competitive product on the market. Contrary to Motorola's increase in partnerships with other firms in developing innovative technologies and software, it decreased its focus on internal R&D by cutting back investments to 10 percent of net sales and the percentage of employees involved in R&D to 36 percent (Motorola, 2005).

The firm did keep its focus on diversifying its product lines as envisioned by CEO Ed Zander and others in the top management team. During 2005, Motorola for instance released a $40 mobile phone aimed at first-time buyers in India, a phone with censoring software to target the children and young-adult market segment and a new mobile phone which could sync seamlessly with Apple's iTunes computer software.

Especially this last example was long awaited by market analysts and consumers alike. The Motorola Rokr, as the iTunes phone would be named, was expected since July 2004 but was postponed several times and released not until September of 2005. However even though the product was highly anticipated and desired by the music-loving consumer, sales of the Rokr were highly disappointing to Motorola's top management. While the overall strategic goal of developing this iTunes phone may have been spot on, the execution had several weaknesses. These weaknesses caused the Rokr to be unattractive to potential consumers, who decided to stick to using separate mobile phones and MP3 players.

Very interesting though, was an interview held by the New York Times in May 2005 with several executives of Motorola. During this interview, CEO Ed Zander remarked that the mobile phone industry was in "*a period of incredible flux*" (Lohr, 2005). As the stated, the market was changing so rapidly that in his view, *''the big challenge for every company over the next five years is to figure out what you are and how you make money"* (Lohr, 2005). With this citation, Ed Zander seemed to recognize the idea that Motorola's current way of operation might not be successful in the years to come. However when asked about Motorola's vision for the future as far as the mobile phone market, Geoffrey Frost, Motorola's chief marketing officer, replied: "*We haven't figured out ourselves where it's headed*" (Lohr, 2005). With this short reply, Mr. Frost admitted that Motorola had no well-established vision of what the market would look like in just a view years' time, other than that it would be significantly different than it was in 2005.

As it did for 2005, Motorola again made some small changes to its top management team for 2006. Again, Motorola's top management team decreased in size as now only eleven people were part of this team. These changes had no effect on the degree of relations-oriented diversity, which remained at 1: low diversity. The second dimension, task-oriented diversity however increased slightly. While the scores for the three indicators of industry background, job background and firm tenure remained

virtually unchanged, diversity in top management team tenure had increased in 2006 as compared to 2005 leading to a score of 2: medium diversity for the task-oriented dimension. The changes however, did not affect the degree of task conflict which continued to be low in the top management team.

During 2006, Ed Zander's functional background in the computer industry began to influence Motorola's innovation strategies more and more. With his background in the software business of Sun Microsystems, Zander's view was that "*compelling user experiences are what win in today's marketplace and innovative software is the key*"(Taylor, 2006). He therefore put a lot of emphasis on improving the software development across Motorola's businesses, including of course its important mobile phone division. In this division, the choice had been made to concentrate its mobile phone software platforms on Linux. While it had already produced a couple of mobile phones using Linux, Motorola's strategy was now to base 50 to 60 percent of its mobile phones on Linux within just a couple of years.

Motorola's commitment to the software side of its devices was also stated explicitly by its new chief information officer Patricia Morrison in October of 2006 when she remarked that "*I don't care about the hardware, I only care about how it's used*" (Tan, 2006). Thus, in her view, the hardware that is incorporated in Motorola's devices is never the most important aspect of development. Rather, it is how this hardware facilitates useful software applications and new functionalities that enhance the end-user experience. Another example of Motorola's focus on software can be found in the restructuring of its software developer networks. While it used to have three, namely Motocoder, Iden and Horizon, it now brought these three networks together under the name Motodev, to stimulate software development on all of its relevant business divisions.

In the following year some new changes were made to the top management team. With the addition of Patricia Morrison to the top management team, diversity in the indicators of year of birth and gender increased slightly, leading to a score of 2: medium diversity for the dimension of relations-oriented diversity. The first indicators for task-oriented diversity, being top management team tenure, increased as well in 2007 as compared to 2006. However, because of a decrease in firm tenure, the overall score for the task-oriented diversity dimension remained a 2: medium diversity. What is very striking however is that with the departure of Ronald G. Garriques, there was no longer a top management team member who was head of the Mobile Devices division. This could theoretically lead to a decreased focus on mobile phone development as this division would now be less represented in the top management team.

After Motorola's great success with its Razr mobile phone, difficult times faced the firm in 2007. In the first quarter Motorola posted a loss of $181 million, largely due to its sales numbers of mobile phones which decreased 15 percent as compared to the same quarter a year earlier. CEO Ed Zander responded to these disappointing results with admitting that Motorola had become weak at the market's extremes. During 2005 and 2006, Motorola's efforts to produce an expensive high-end device where profits are high had proved unsuccessful. Even worse, however, was that while the markets in India and China were growing at an enormous pace, Motorola was unable to produce a competitive, low-end device to target these markets. Motorola had thus focused its efforts at developing new mobile phones for the middle of the market, which now led to disappointing results.

In an effort to address the firm's financial problems, Motorola's top management team decided to shift its strategic focus from boosting market share by chasing low-profit sales numbers, to a new emphasis on higher-margin sales and innovative products to target the high-end market segment. Ed Zander remarked that "*it's not just about style any more, we got used to just pushing handsets out there and seeing them sell*" (Taylor, 2007) To enforce this statement, the firm announced a range of new products which would clearly take the firm in a new direction. Instead of focusing solely on style and design, these new products would offer new functionalities such as 3G capabilities, multimedia features and local network capabilities. However, market analysts voiced their critiques that these newly announced products were nothing more than souped-up version of already existing products and that these devices would not be enough to change the tide for Motorola. Thus, while the overall innovation strategy may have been of high quality as it in essence incorporated all aspects relevant to the user experience, the execution of this strategy still left much to be desired.

Nearing the end of the year, when results indicated a global market share drop from 21.1 percent in 2006 to 12.9 percent in 2007 and losses were mounting for Motorola, CEO Ed Zander decided to resign from his post at the end of the year. The extraordinary success of the Razr had blinded Motorola's top management team which kept them from stimulating the development of a continuous stream of replacement products which would offer ever more value to the end-user. Instead, they continued to follow along the same style-oriented path as it did with the Razr, while competitors had already proved to outclass Motorola's styling. As Motorola's success had turned against itself, CEO Ed Zander was held accountable for the failure of Motorola to deliver compelling new products which motivated him to step down. His successor would be Gregory Brown, who was up to then the president of Motorola and head of its Networks & Enterprise Business division and joined the firm in 2003. As stated by several other members of Motorola's top management team, they believed that Mr. Brown, a very pragmatic man, would hopefully be able to take a hard look at Motorola's operations and be able to find a way for its business divisions to benefit each other.

### *2008-2010*

When Greg Brown became CEO in the beginning of 2008, Motorola was again going through a rough time. With the firm's stock dropping 22 percent in a single day after the firm announced an 84 percent decline in profit over the fourth quarter of 2007, it was clear Motorola's top management team would face a great challenge in turning the tide for the firm. In March 2007, the firm announced the appointment of Paul Liska as its new CEO. While Paul Liska was an outsider to the mobile phone industry, he had vast experience in the private equity industry in which he had helped several underperforming firms to return to profitability. Because of this background he was seen as the ideal candidate to help bring Motorola back into a positive financial position. During the next two months, the head of the Mobile Devices division Stu Reed, Chief Marketing Officer Casey Keller and Chief Strategy and Technology Officer Rich Nottenburg all decided to leave the firm and pursue other opportunities. Due to these changes to Motorola's top management team, task-oriented diversity increased to 3: high diversity thanks to the very different industry and job backgrounds of Motorola's new top managers, while the relations-oriented dimension remained at 2: medium diversity and the degree of task conflict was still low.

In the middle of these great changes in Motorola's top management, the firm announced plans to split the firm into two separate entities, one focusing on its mobile phone business and the other on

its networking business. Stimulated by ongoing critique from investor Carl Icahn, the firm decided a split of its divisions would be the right move as each separate entity could then focus on its core business with less bureaucracy.

In July 2008, Motorola announced that Sanjay Jha would be co-CEO and would be head of the mobile devices business. Jha had worked for Qualcomm, a telecommunications firm, for fourteen years and during that time had gathered a great deal of knowledge in the mobile phone value chain which was becoming ever more complex. Because of this previous industry experience, Motorola's top management saw him as a great candidate that could give strong leadership to the firm and define innovation strategies that would reestablish Motorola as a leading mobile phone producer.

Nearing the end of 2008, Motorola indeed made a clear decision on its mobile phone innovation strategy. For future success, it would bet heavily on high-end smartphones using Google's new Android operating system. By using this operating system, Motorola would not have to develop the operating system itself, but rather concentrate on the graphical user interface, additional software and of course the hardware incorporated in its devices. By making this fundamental change to its innovation strategy, it could save a great deal of time and money in the development of new mobile phones and be sure to implement a competitive operating system.

While CFO Paul Liska was seen as a great contribution to Motorola's top management team when he joined the firm in 2008, he was fired in the beginning of 2009. According to him, he was fired after complaining about the firm's deliberate over-inflation of the financial forecasts of its mobile devices division. Because of his sudden leave Motorola had to find a replacement Chief Financial Officer which it found in the form of Edward J. Fitzpatrick, who acted as the firm's head of the Connected Home Solutions division until 2005. Two other additions to the top management team were Sanjay Jha, co-CEO and head of the Mobile Devices division, and Karen Tandy as head of Public Affairs and Communications. Due to these additions and the departures of Paul Liska, Kathy Paladino, Patricia Morrison and Rita Lane, the latter three quit to pursue other opportunities, relations-oriented diversity decreased to 1: low diversity while task-oriented diversity increased to 3: high diversity due to the industry and job backgrounds of the new top managers. The degree of task conflict, however, was very low seeing that each of the firm's eight top managers had clearly different task descriptions within the top management team, leading to very little overlap.

Motorola's decision to focus the software aspect of its innovation strategy on Android was reinforced in July 2009 when the firm announced a new program for which it re-used the name Motodev, which would give third party software developers early access to useful software tools and programs. This allow them to get a head start in creating new applications for the firm's future Google Android devices, for which these developers could profit financially. In order to deliver new high-quality, high-end mobile phones Motorola significantly stepped up its R&D investments, with 42 percent of employees and 13,7 percent of net sales invested in R&D projects (Motorola, 2009).

At the same time, the renewed innovation strategy was providing its first results when at the end of the year, the firm announced its first quarterly profit in almost two years. The graphical user interface Motoblur, which Motorola displayed on top of the Android operating system, proved a huge hit with consumers as it dramatically improved the user experience over the original Android user experience. By facilitating instant connection with social networks like Facebook and Twitter,

which were growing in popularity at an incredible pace, Motorola's mobile phones were in great demand. The firm's innovation strategy of developing the Motoblur user interface with its social network connection thus proved a great move at the end of 2009.

At the beginning of 2010, some new announcements of changes to Motorola's top management team were made. Greg Lee, Chief of Human Resources, held himself accountable for the debacle with former CFO Paul Liska and decided to leave Motorola in 2002. In order to get further grip on the firm's financials, the top management team announced the appointment of John Wozniak as its new Chief Accounting Officer. Because of these changes, relations-oriented diversity increased to 2: medium diversity due to a higher degree of diversity in the age indicator, and task-oriented diversity remained at 3: high diversity.

Following the firm's positive results of its small profit in the end of 2009, Motorola again announced a profit in the first quarter of 2010 as it topped its own financial forecasts which was continued in the second quarter. The firm, however, was still seeking new ways of strengthening its core businesses by eliminating stifling bureaucracy and unnecessary internal competition for attention and resources. In July 2010, the announcement was made to sell the wireless network equipment business to Nokia Siemens Networks for $1.2 billion. This way, the firm could focus on its core businesses, of which the handset business was seen as the most important one.

While software development, with Motoblur at the front, had been a huge part in Motorola's success over the last few quarters, CEO Sanjay Jha announced in August the firm would take a new direction in its innovation strategy. As he admitted "*it's hard to convey the value of Motoblur in a 30-second ad*" (Cha, 2010). Therefore, while Motoblur had been very important to the firm's recent success, the top management team felt it was hard to convince potential consumers of Motoblur's added value in a short commercial. As a new strategic direction, the focus would be more on the individual products the firm would develop and what their unique and valuable features would be. This decision, which was very much influenced by co-CEO Sanjay Jha's background as the Head of Design and Chief Operating Officer at Qualcomm, already became apparent with the introduction of the new Droid X and Droid 2, both using Android, in which the focus was on each phone's unique features and value for the end consumer.

Nearing the end of the year, Motorola's innovation strategies again proved successful as the firm reported the first operating profit of the mobile devices division since 2006. Indeed, its strategic decision to adopt the Android operating system had enabled the firm to develop its mobile phones faster, cheaper, and of higher value for the consumer. The significant changes made to Motorola's top management team had finally enabled the team to define strategies that would enable a path of success for the future. Diversity in this team played a key role in its recent ability to make the right strategic decisions. Especially the indicators belonging to the task-oriented dimension of diversity have enabled Motorola's top management team to make well informed decisions based on intimate knowledge of the firm itself, the mobile phone industry as well as the mobile phone value chain.

After the initial announcements made in 2008 to split the firm in two different entities, Motorola announced in late 2010 had these plans would be effective from January 4$^{th}$, 2011. Time will tell whether or not this split will indeed enable the separate entities to focus on their core business better in order to further improve their success in the future.

## 6.1 Influence of the moderators

As for the first case, the way in which the indicators of diversity have influenced the mediating variables and Motorola's innovation strategies has to be put into perspective by discussing the three moderating variables that are thought to influence these relationships.

### *Communication*

In the case of Motorola, we find evidence that confirms the importance of extensive communication within the top management team and how this moderating variable is influenced by other variables. During the years, we see signs of limited task conflict between Motorola's top management team. As the firm spun-off several its divisions over the years, the number of top managers decreased. However during the whole of this research, most top managers had a very distinctive task different from others', meaning that there was little overlap in the specific job description of each of the top managers. Because of this, there was little communication between the top managers about the future vision, the policy on innovation and the innovation strategy of the firm as a whole, and specifically the mobile phone division. The low degree of this important communication therefore formed a barrier to the free flow of diverse knowledge within the top management team, negatively influencing the team's strategic decision making abilities.

### *Competence-based trust*

Over the period 2002-2010, we generally see a high degree of competence-based trust in the different top managers. Top managers who worked their way up the ladder within Motorola had proven their capabilities and therefore little doubt was raised as to their competence as a top manager. During the years though, several top managers also entered the top management team from outside of the firm. While this could generally lead to a lower degree of competence-based trust for these specific top managers, little evidence could be found to support this in the case of Motorola. Most of these new top managers had already had years of experience in the telecommunications industry or other high-tech industries, and also had diverse top management experience in those other firms. Therefore, as they entered Motorola, the 'old' top managers had a high degree of trust in the competences of the fresh top managers. In the case of Ed Zander, CEO until the end of 2007, though, we see how a decline in competence-based trust can have a profound effect within a firm's top management team. Shortly after Zander joined Motorola, the firm had a huge hit with the Razr mobile phone. As competition quickly caught up with Motorola's stylish mobile phones, the firm was unable to develop new successful mobile phones. Zander's ability to successfully lead such a large, high-tech firm were therefore questioned within the top management team, within the lower ranks of the organization as well as by outside business analysts. This decline in competence-based trust in Ed Zander led to a power struggle within the firm's top management team, as other top managers tried to increase their strategic decision making power to return the firm to success.

### *Power struggle*

As discussed above, Motorola's inability to develop a stream of innovative mobile phones caused the firm to lose its competitive position in the industry. Because of this great disappointment within the entire firm, some of Motorola's top managers sought to increase their power in the firm as they believed Ed Zander was not suited for the position of CEO. This struggle, which resulted in Zander

leaving the firm, did hamper the strategic decision making process within the top management team though. As several top managers tried to increase their power, they got in each other's way and conflicted heavily on how the power should be distributed among the different top managers. This struggle then influenced the strategic decision making process negatively, as the different top managers were unable to reach consensus on how the firm should adapt its strategies in order to return to profitability.

## 6.2 Summary of the analysis

The case of Motorola over the period 2002-2004 has been very interesting. While the firm's top management team had initially been successful in returning the firm to profitability in 2002 by developing general platforms for its mobile phones in order to reduce development costs, its innovation strategy was not up to the industry standard which had a negative effect on sales as Motorola's mobile phones were outclassed by those of its competitors. As a result, a clear turnaround was necessary in order for Motorola to reestablish itself as a dominant force in the mobile phone industry. In order to do so, Motorola shifted its innovation strategy focus from hardware improvement to designing and software development. Unfortunately for Motorola, the memories of its failed Iridium project had been lingering within the minds of many of Motorola's employees, among which some top management team members. Due to this failure in the past, Motorola had taken a cautious approach to innovation, focusing mainly on improving existing technologies instead of developing new technologies to add features. Because of this, Motorola was late with the introduction of its mobile phones with technologies such as color screens, camera's and multimedia messaging capabilities. In search of strengthening the strategic decision making capabilities of the top management team, the then CEO stepped down and search began for a new CEO from outside the firm. Ed Zander was found to be the perfect candidate due to his background of management positions in the computer software industry, thus increasing the diversity in industry backgrounds present in the top management team. He took it upon himself to create a sense of urgency within the organization and get rid of the cautious, bureaucratic culture that existed within Motorola. As part of his vision of his fresh take on the industry, Motorola's innovation strategy started putting more emphasis on developing multi-functional mobile phones with specific importance given to functions that would appeal to enterprise consumers. To increase its chance of success, Motorola's policy on innovation involved a higher degree of cooperation with other firms as it started new partnerships in an effort to strengthen the software aspect of its mobile phones. At the same time, Motorola's previous strategic decision of focusing more on the design aspects of its mobile phones was successful with the huge hit that was the V3 Razr.

Motorola continued its cooperative policy on innovation over the next few years. This resulted in cooperation with Skype to integrate its popular internet calling software on some of Motorola's new mobile phones. At the same time, it produced a mobile phone called the Rokr, which it developed in cooperation with Apple to work seamlessly with its iTunes software. As for its vision for the further future, Motorola's Chief Marketing Officer commented that while it did recognize significant change in the industry, Motorola did not have a clear vision of what the market would look like in several years. What it did envision though was the increasing importance of software, which Ed Zander had already seen happening in the computer industry during his previous industry experience. During his tenure, this vision began influencing Motorola's innovation strategy more and more as it now saw software as the critical element in user experience. This resulted in a restructuring where its three

software development networks were brought together under the name Motodev. Unfortunately though, Motorola's new innovation strategies looked like they had been too little, too late as the firm kept losing ground as it continued to lag behind its competitors. Partly due to the low degree of task conflict within the top management team, the firm had been unable to positively stimulate useful conflict between the firm's top managers. The possible advantages of diversity that existed within these teams could therefore not be used effectively, leading to innovation strategies that did not provide the firm with competitive advantage.

In 2007, the firm had to report some very negative results. Its sales numbers dropped and profits turned to losses. An important reason for this was attributed to Motorola's inability to compete at the market's extremes. To counter these negative results, Motorola redefined its innovation strategies by focusing on higher-margin, innovative mobile phones. In order to do this successfully, it had to become less style-minded and incorporate new technologies that would add functionalities to its mobile phones. However, Motorola's CEO Ed Zander was held accountable for its inability to come up with a stream of compelling devices which led him to step down in the end of 2007 end be replaced by Gregory Brown.

Another big change to Motorola took place when the firm announced to split into two separate entities, one focusing on mobile phones and the other on networks. To lead the mobile phone business, Sanjay Jha was appointed as co-CEO to Gregory Brown. Sanjay Jha had previously worked for telecommunications firm Qualcomm, and had extensive knowledge on the increasingly complex mobile phone value chain. His previous industry background influenced Motorola's mobile phone innovation strategy a great deal when it announced the Android operating system would be used as the basis for its comeback, by producing high-end smartphones for which the firm developed its own graphical user interface called Motoblur. This decision proved highly successful when nearing the end of 2010, Motorola's mobile phone division reported its highest profit since 2006. The appointment of Sanjay Jha as co-CEO of Motorola thus appeared a great move in the firm's return to success. Due to his industry and job backgrounds, he was able to define a clear future vision about the mobile phone industry and define concrete actions for the firm to take, which translated itself into the firm's innovation strategy which played a huge part in its recent success.

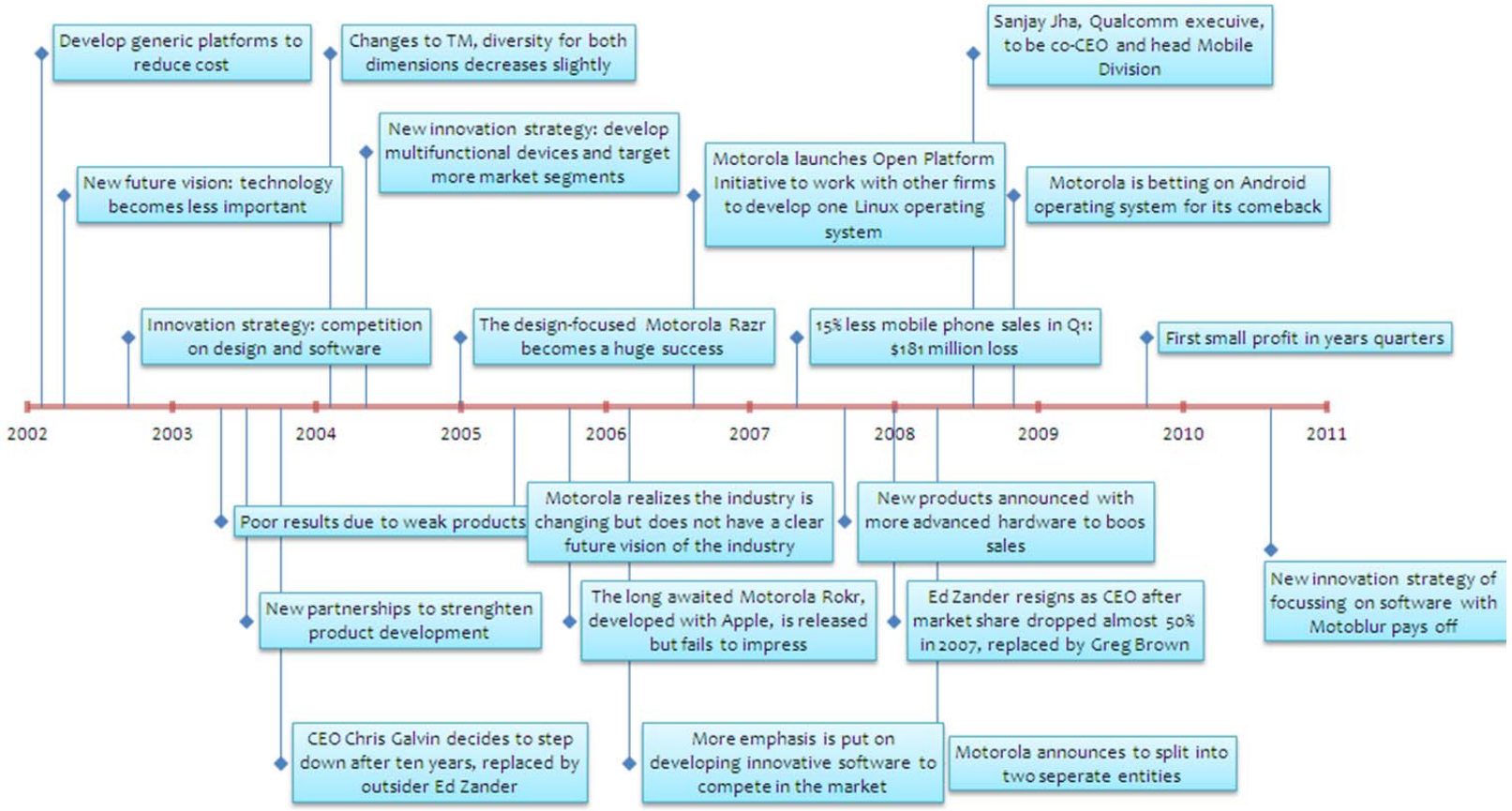



**Figure 8: A timeline showing important events for Motorola between 2002-2010**

# 7. Case 3: LG

In June 1999 the CEO of LG, John Koo, presented a new strategy for the new millennium: marketing, technology, design and cooperation would become the four core competences of the firm. This new strategy, LG hoped, would allow the firm to reach the ambitious goals it had set for itself: to be among the top three international electronics, information and telecommunications firms worldwide before the end of 2010. In pursuit of this goal, LG focused on innovation and design – the only possible approach the firm saw to establish itself for the long term. This very important new overall corporate strategy would form the fundamental background for the analysis which will be carried out for the rest of this chapter. Again, a timeline for the case of LG and its most important events will be presented on page 71 of this report.

**Control variables**

Like the other two cases, the background of LG will be described by briefly discussing the control variables for this firm.

The South-Korean based firm was founded in 1958, then called LuckyGoldstar. The firm produced many consumer electronics, among which South-Korea's first radio. Over the next decades, the firm developed itself and expanded its industry activities. In 2002, it was active in a diverse range of industries including home appliances, air conditioning, digital displays, optical storage, mobile phones and mobile phone network equipment. Because of this, LG receives a score of 3: high diversity for the control variable of diversity in industry activities. During this time, LG had roughly 75.000 employees with an annual net income in 2002 of approximately $4.420.000.000 (LG, 2002).

### *2002-2004*

During 2002, LG's top management team consisted of ten members which were responsible for LG's strategies that would hopefully enable the firm to reach its overall strategic goals. As all of these ten top managers were male, South-Korean and born in roughly the same time period, the score for the relations-oriented dimension of diversity is 1: low. The indicators for the second dimension did show diversity however. While average top management team tenure was low, with the longest tenure only six years in 2002, the average firm tenure was very high with low diversity in this indicator as most top managers had served with LG for their entire careers. Coupling these two indicators reveals that in LG, most of its top managers have been part of the firm for a very long time yet part of the top management team only for a few years. Diversity within each of these indicators was thus low, yet diversity *across* these indicators was very high indeed. As mentioned, most top managers had served LG for their entire career. Even though this might seem like LG's top managers therefore only had limited professional experience, most top managers had had very diverse jobs within LG's different divisions. Therefore, diversity within the indicators of industry background and job background was high. Coupling the scores of these four indicators together brings a total score of 2: medium diversity to the dimension of task-oriented diversity. As for the other firms, graphs which visualize LG's top management team diversity have been included in this report in appendix 4.

Between these ten top managers of 2002, the degree of task conflict was low. With LG being active in so many industries and markets, each of the top managers had a very distinctive task which meant very little overlap between the tasks of the various top managers.

In order to achieve the ambitious goal of becoming the third largest electronics producer, LG realized simply strengthening its competitive position in its existing markets was not enough; LG had to successfully enter and expand in new markets as well. Now, what did this mean for its mobile phone division?

In 2002 LG's mobile phones were already very successful in markets which used the CDMA standard, most importantly South-Korea and China. However in order to achieve its ambitious goal, LG had to substantially expand its mobile phone operations by producing handsets which incorporated the GSM standard as well in order to successfully enter the European market in the near future and expand its presence in the US. To work towards this goal LG stepped up its R&D investments in 2002 with a record percentage of 16 percent of net sales invested in R&D, for a workforce of 46 percent employed in R&D activities (LG, 2002).

Of special importance in the mobile phone division was the upgrading of product competitiveness, in which LG focused on high-end phones by developing new technologies such as organic light emitting diode (OLED) displays and further improving the current technologies as used in its devices. This innovation strategy already showed signs of success by the end of 2002, with sales of LG's CDMA-based mobile phones being 35 percent higher in 2002 than they were in 2001. As for the European GSM-based market, LG envisioned a rising demand for more and more technologically advanced mobile phones. If this were to be true, LG thought it would find itself in a very favorable position. As the South-Korean mobile phone market was more technologically advanced in 2002 than the European and US markets, LG thought it could use its experience of the South-Korean market when designing more complex and advanced mobile phones for the European and US markets.

While LG was successful during 2002, it made some changes to its top management team during 2003. As LG now had clear goals as to increasing its position in current markets as well as entering markets that were virtually new to the firm within the next two years, it felt that it had to make changes to its top management team in order to enable itself to actually reach these goals. During these changes, LG's top management team expanded to twelve members during 2003. With the addition of two new top managers from within the firm and Ssang Soo Kim being promoted to CEO, little changed when looking at the indicators belonging to the two dimensions of diversity. The score for relations-oriented diversity therefore remained at 1: low diversity and the score for task-oriented diversity remained stable at 2: medium diversity.

Even though diversity within the top management team remained virtually unchanged in 2003, this did not mean that the changes in LG's top management team of 2003 were not significant. As one can see, LG got a new CEO with a very clear vision for the firm. As he stated, his management style focused on "*early innovation, stretching goals and field management*"(Choong, 2003). What he meant with these three areas was that, in his vision, LG should not just be innovative, it should develop and commercially exploit innovations before any of its competitors were able to in order to generate clear competitive advantage. Part of this vision was the Tear Down and Replace idea, where products and processes were continuously being redesigned to seek performance improvement, rather than only by making incremental changes. Additionally, LG had set up two new headquarters in 2003, specifically to enable the firm to meet the needs on the European and The US markets. By setting up these new headquarters, LG had created two new top management positions with the sole responsibility of leading these headquarters. Thus, while the European and The US markets fell under

the responsibilities of the already existing departments of LG before 2003, they were now assigned to new departments which focused solely on either specific market. This meant that the degree of task conflict between LG's top management team of 2003 increased to a medium amount as compared to the earlier years, as there were now more departments and top managers involved with for instance the development of new technologies for mobile phones for the European market. Effects of the establishment of these new departments and increase in task conflict can indeed be seen when analyzing the data for LG in 2003 as will be described further.

During this year, LG continued along the lines it had planned in 2002 and expanded on its already existing innovation strategies. In its home base of South-Korea, LG was used to engage in extensive cooperation with mobile phone network operators in the development of its new phones. This cooperation thus meant that in its innovation policy, LG looked at network operators not just as a client who bought the product LG had designed on its own, but rather develop new products in cooperation with these network operators to ensure that these new phones would suit the requirements and needs of the network operators. As this strategy had enabled LG to become a dominant player in South-Korea, it this same cooperation-driven policy for Europe and The US. An example of this strategy can be seen in LG's cooperation with Verizon Wireless, the largest network operator in the US in 2003, when LG developed a new CDMA-based mobile phone specifically to the needs of Verizon Wireless. LG could sign a lucrative deal with Verizon Wireless, making LG the number one supplier of mobile phones to Verizon Wireless and become the world's largest CDMA-based mobile phone producer.

This example shows nicely how a firm's policy on innovation, in this case extensive cooperation with network operators, can directly influence that firm's innovation strategies. The underlying reason for this very cooperative policy is the previous experience of LG's top management team of 2003. As most of its top management team had been with the firm for a long time, they were part of the firm as it grew from a relatively small and national firm to a very large, internationally-operating firm. As LG had already engaged successfully in extensive cooperation with network operators in South-Korea, LG's top management team could use these past experiences to establish equally fruitful relationships with network operators in Europe and The US. Additionally, it shows the benefit of increased task conflict within the top management team as the new US and European headquarters allowed the firm to engage in successful cooperation with these network operators and enable internal cooperation between the different departments to work towards the firm's overall shared goals.

At the end of 2003, LG's innovation strategies proved to have been very successful indeed. Despite the worldwide telecommunications market being in an 'extreme slump' in 2003, LG had managed to increase its year on year sales number with 47 percent as compared to 2002. As a result, LG had become the number five largest mobile phone producer worldwide. In order to grow even further, LG decided to continue focusing its innovation strategies on high-end mobile phones for the US and European markets where it felt it could still increase its market share significantly. In order to remain able to develop innovative devices, LG further increased its expenses on R&D to 18 percent of net sales (LG, 2003).

With LG's highly successful year of 2003 and ambitious vision for the future, LG had its work cut out for itself in 2004. In order to improve the strategic decision making process some changes were

made again to LG's top management team in 2004. Like the changes made in 2003, these changes had no significant effect on the degree of relations-oriented diversity which thus remained at 1: low diversity. However with the addition of three new top managers, average top management tenure came down as diversity in this indicator increased slightly. Diversity in the second and third indicators, Industry background and job background, remained relatively unchanged during these top management team changes. Diversity in the final indicator, firm tenure, decreased slightly with the changes made in 2004. Aggregating these four indicator together generates a score of 2: medium diversity for the dimension of task-oriented diversity. Unlike the previous year though, these changes had no effect on the internal organization of the top management meaning that the degree of task conflict between top managers did not change.

As LG's innovation strategies of 2002 and 2003 proved very successful, the firm continued its strategies at the beginning of 2004. Its vision for the future was still to be among the top three electronics and telecommunications firms worldwide by the end of 2010. In order to accomplish this, LG put emphasis on fostering both mid- and long-term innovations both on the product level as well as on the larger management level. It did so by continuously investing in the fundamental redesigning of existing products, actively stimulating generation of new ideas among all levels of employees, and constantly reevaluating its organizational structure to ensure innovation would not be hindered by bureaucracy or internal politics. The goal of this was to continuously remain in touch with the market and develop its mobile phones accordingly.

To continue its success of 2003 and in line with the CEO's management vision, LG's innovation strategies remained focused on high-end, technologically advanced mobile phones in close cooperation with network operators. The cutting edge, cooperation-driven policy of the previous years was therefore strengthened by the firm's recent success. In order to accomplish LG's goal of '*early innovation'* it forged several new strategic affiliations which would help it gain early market access to new markets and utilize new technologies. Among others, this resulted in LG's development of the world's first phone equipped with terrestrial DMB, which enabled South-Korean users to watch a selection of television channels on their mobile phone. As for the European and the US markets, LG remained committed to establish close relationships with network operators, which resulted several deals such as one with Hutchinson to supply three million 3G handsets. In close cooperation with these network operators, LG defined its innovation strategy of targeting consumers aged 13-18 and develop mobile phones specifically for mobile operators to target that group of consumers. As stated by Bae Jae-hoon, a then high-ranked employee in LG's Mobile Communications division, in an interview with the Financial Times: "*We are targeting consumers aged 13-18, because teenagers buy expensive products and lead trends. So when they buy our phones, everyone else will eventually follow*" (Fifield, 2004). In order to target this important market segment successfully, LG strived to incorporate ever more features into its mobile phones as well as adhere to the latest trends in the style department.

At the end of the year, LG's innovation strategies had proven to be of very high quality yet again. Over the year, LG had succeeded in expanding its mobile phone market share even further with a year on year growth rate in sales of a remarkable 61 percent which was the highest growth rate realized by any of the world's leading mobile phone producers. As stated, LG had done exceptionally well in improving mobile phone value by realizing that consumers were becoming ever more demanding of features and styles, and were less bound by traditional brand relationships.

***2005-2007***

In 2005, LG's top management team remained as it was in 2004, meaning that diversity between LG's top managers stayed the same as well. During the year however LG did make other significant changes in its organization, all aimed at becoming a more globally oriented firm. The first important change was the policy to recruit more international workers for LG's R&D department. While the vast majority of its employees were traditionally South-Korean, LG realized a more diversified staff could benefit its product development. Plans were therefore made to recruit at least 30 percent of its global research engineers from outside South-Korea. In order to further enhance LG's global perspective, a new research and development center would be set up in San Diego in the US. This research center would work closely with US network operators to help identify the latest trends in culture and style in the US, the design new mobile phones specifically for this market. The third and perhaps the most important change within LG was the announcement that by 2008, LG wanted that every singly e-mail, fax, phone call and meeting within the organization would be in English instead of Korean. This would hopefully lead to a more global mindset within the workforce while at the same time lower the barrier for international employees to join LG.

As the year went on, LG's success over the past few years seemed to come to a sudden end. While its market share had gone up steadily every quarter, halfway 2005 new results came in which showed this trend to stop. While LG had been very successful in the mid and high-end of the market, most of the market growth in 2005 came from the low-end. Because of LG's decision to focus its development on premium products, it was badly placed to take advantage of strong demand in emerging markets such as South America, Eastern Europe and Asia. LG recognized this fact when its Chief Technology Officer Hee Gook Lee stated that LG "*could have done much better in product planning*" (Gowers, 2005). In his opinion, LG had spotted the trend of market growth coming from the low-end, but had not responded to this trend. The firm's decline in success translated to the loss of its number four position in the global mobile phone market which it lost during the third quarter to competitor Sony Ericsson.

Even though 2005 was a difficult year for the firm, this did not affect its strategic goal of becoming an ever more powerful force in the mobile phone industry. In October 2005, CEO Ssang Soo Kim stated that the firm aimed to double its global mobile phone market share to 14 percent over the next two years. This growth would be to come from a new focus on mobile phones using the GSM standard instead of CDMA. While LG had been very dominant in the global CDMA markets, GSM was much more widely used with a global market share of 70 to 80 per cent in 2005. Therefore, if LG wanted to grow significantly, it had no other choice but to develop more mobile phones for the GSM markets. Perhaps remarkably, LG had deliberately chosen not to respond to the current trend in the industry which was pursuing growth through developing low-end phones to emerging markets such as India and Africa. Instead, its innovation strategy remained focused on premium, high-end devices for markets in South-Korea, the US and increasingly Europe.

In order to further strengthen the strategic decision making capabilities of its top management team, two top managers were replaced by others from within the firm in 2006. As in the years prior to 2006, the changes made had no effect on the relations-oriented dimension, for which the score 1: low diversity remained. The scores for the indicators for the second dimension, task-oriented diversity, also remained largely the same. Only for the top management team tenure indicator did

the score change slightly in 2006 as compared to 2005. With the departure of two top managers and the addition of two new ones, diversity in this indicator increased a fraction. The overall score for this dimension however remained stable at 2: medium diversity. What is more noticeable though was the specific task of each of the top managers during 2006. In fact, the firm had done some restructuring to its top management team to enable better decision making for each of its divisions and each of its important markets the firm was active in. What this meant for the top management team was that the Chief of South-Korea Sales & Marketing and the Chief of Human Resources were no longer present within LG's top management team of 2006. In fact, they were replaced by the chiefs of the China Headquarters and the South-West Asian Headquarters. By making these changes, LG hoped to increase the quality of its strategic decision making process that would enable the firm to be even more successful across its product portfolio and active markets. Comparable to the previous change to the organizational structure, this led to a slight increase in task conflict in the top management team. As there were now more top managers involved with the task of defining innovation strategies for LG's mobile phone division, this increased task conflict could lead to a greater degree of sharing of information on market changes, technological developments and possible directions for the future. Therefore, the innovation strategy could theoretically benefit from the increased degree of task conflict in LG's top management team of 2006.

LG's decision to focus more on mobile phones using the GSM standard which was made in October 2005 began to have effect in June 2006. With LG's market share dropping in the US it decided to try to offset this loss by an increase in the European market share, for which it needed GSM phones. However, the US and European markets were fundamentally different from each other which urged LG to rethink its innovation strategies. While the US market was characterized by dominant presence of its network operators, the European market was regarded as much more open. This meant for LG that its policy of developing mobile phones in close cooperation with a network operator and selling it exclusively through that specific operator which worked so effectively in the US, would not work in the European market. LG realized this all too well and knew that it had to make fundamental changes to its innovation strategies. To be more precise LG could no longer see the network operator as the consumer for which it developed mobile phones, but rather development should focus on the end consumer for a mobile phone to be successful in the open European markets. The strategy chosen by LG was to develop design-focused phones such as its recently released Chocolate phone, which would hopefully raise brand awareness in Europe and boost LG's market share. At the end of the year, LG announced a new phone called the LG Prada. This phone, which was developed in cooperation with the Italian fashion house Prada, was indeed targeted at the fashion-conscious consumer. However, it was also the very first mobile phone which featured a touch screen based on the new capacitive touchscreen technology. LG therefore tried to include all aspects relevant to the user experience of its mobile phone in its innovation strategy, making it of high quality.

With this new strategy, however, LG again did not respond to changes within the global mobile phone industry which became apparent during 2005 when the low-end markets were considered to be the main drivers for global demand. While numerous business analysts stressed the need for mobile phone producers to develop cheap mobile phones to capitalize from these new growth markets, LG refused to adopt this strategy. As stressed by its head of the Mobile Communications Division, LG should not be obsessed with short-term profits or losses and should stick to its premium brand image. The continued pursuit of this high-end strategy did indeed have its unfortunate effect

on the firm during 2006. Near the end of the year when its results over the third quarter were presented, LG had to report an 86 per cent drop in net profit in the third quarter as compared to a year earlier. Much of this decrease in profit was attributed to a significant decrease in its mobile phone sales numbers. Based on these very disappointing results, the decision was made to replace LG's CEO Ssang Soo Kim with Yong Nam, effective January 1st of 2007. Yong Nam, who had a background of extensive experience both in general strategic planning as well as in LG's telecommunications division, was seen as the perfect candidate to return the firm to success.

When Ssang Soo Kim left LG in 2007, other top managers were replaced as well. In total, four top managers stepped down and five new members, two of which had already served as top managers for LG, entered the top management team during the year. In line with LG's corporate culture at the time, most of its new top managers came from within the firm after many years of service. Again, due to their similar background to the top managers who left, relations-oriented diversity remained unchanged at 1: low diversity and task-oriented diversity remained at 2: medium diversity while the degree of task conflict also did not change.

Fresh CEO Yong Nam realized all too well LG's success was beginning to fade when he took charge in 2007. In his view, LG needed to become a trendsetter to become successful again which he stated during a press conference. To shake things up, Mr. Nam asked the Human Resources department to bring in new top talent from multinationals around the globe. This was a great break from the past, in which LG used to stimulate long-service and look for talent mostly within its own organization. The same outward-perspective was also carried through in its product development. While LG's top management team of 2006 already changed its innovation strategies to develop mobile phones with the end consumer in mind more predominantly, Mr. Nam reinforced this strategic decision. He stated that LG should not be too preoccupied with its competitors and countering their moves, but instead focus on the consumers it develops its products for.

In an interview with reporters from the Financial Times, Mr. Nam was asked about LG's response to the global mobile phone market in which demand was driven by the low-end market. His answer was that even though he recognized this fact, LG maintained its focus on the premium segment. As he stated "*the premium markets, premium segments, have generally more revenue and profit opportunities over time*" (Fifield, 2007) which indicated that he believed that in order to re-establish LG's success for the future, developing high-end products was the key. It therefore looked like CEO Yong Nam was keen of continuing the high-end focused innovation strategy as outlined by his predecessor. In order to boost the success f its future mobile phones, LG tried to put even more work in research in development, by increasing its spending to 21 percent of net sales (LG, 2007). In doing so, the top management team had hoped to gain a competitive advantage over other firms operating in the high-end mobile phone market.

On the shorter term, this strategy had begun to pay off. In July 2007 LG reported its record sales numbers of 21,9 million mobile phones which boosted its market share up to 7,6 per cent. However because it had achieved these sales numbers with mid to high-end devices in which profit margins are relatively high, LG also reported its highest ever quarterly profit with a record profit margin of 11,6 per cent. A lot of LG's tremendous success during 2007 could be attributed to its stylish bestsellers which included the Chocolate, Prada and Shine. Because of this great success, LG's top management team was keen on pursuing this strategy in the future. As stated in a different interview

with The Financial Express about LG's strategies for the future: "*Everybody in the industry is competing on price but LG will take just the opposite route to establish its products as more premium than ever before*" (Roychowdhury, 2007).

In the pursuit of these premium products, LG's top management team stressed that it was not only looking at opportunities within the organization. It was very explicitly stated that acquisitions of other firms and intensive cooperation with other firms were to be very important in identifying opportunities, gathering the right knowledge and equipment and exploiting these opportunities successfully. One example of this cooperative policy on innovation was LG's interest in Android. In 2007 when Google announced the Open Handset Alliance which was aimed at creating the open platform called Android, LG showed clear interest in this project. Using Android, LG could incorporate a competitive, open source operating system on its mobile phones while still focusing its internal development on the design of its mobile phones. Therefore, LG saw this alliance as very welcome and complementary, as the necessity to develop software in-house decreased and more effort could be put in to developing stylish new mobile phones.

### *2008-2010*

In the beginning of 2008, CEO Yong Nam's vision of turning LG into a truly globally-oriented firm began to have a clear effect on LG's top management team. During the year, eight new top managers were appointed. Most profoundly were the appointments of three foreigners; Tom Linton, Didier Chenneveau and Dermot Boden to the top management team, as Chief Procurement Officer, Chief Supply Chain Officer and Chief Marketing Officer respectively. Through these new foreign top managers, relations-oriented diversity increased to 2: medium diversity and task-oriented diversity increased as well. While, up to then, almost all of LG's top managers had worked themselves up through the ranks in LG, these three top managers came from very different firms from very different industries. Additionally, they had previous industry and job backgrounds which up to 2008 were not represented within LG's top management team. Through these changes, which led to a high degree of task conflict and increased task-oriented diversity within the top management team to 3: high diversity, LG hoped to increase its profit by reducing its expenses related to its supply chain.

Under CEO Yong Nam's leadership, LG intensified its consumer-centric approach to its product development. With Dermot Boden as its new Chief Marketing Officer and his background in fast moving consumer goods, LG set up new projects using consumer focus-groups and "Innovation Challenges" aimed at including the end consumer more in the process of new product development. To get a feeling for broader trends in popular culture, LG's top managers as well as lower ranked executives regularly attended home and design shows across the globe which could be used as further input for LG's innovation strategies.

In July of 2008, LG's CEO announced new plans for the firm to increase its global mobile phone market share from approximately 9 percent to 15 percent in just 18 months time. In order for the firm to reach this ambitious goal it was clear only offering high-end, expensive mobile phones was not enough. Instead, LG planned to "*win over consumers' hearts there by coming up with differentiated products tailored to local tastes*" (Jung-a, 2008). Part of this differentiating of its products was to, in contrast to earlier years, expand its product portfolio with new low-end mobile phones as well. In order to develop these new differentiated products with the highest chance of success, LG again used its policy of active cooperation with network operators around the globe, a

policy most of LG's top managers were very familiar with due to their long service with the firm. An example of this policy comes forward from the release of the firm's very first smartphone for the US market, the Incite, which was developed in very close cooperation with network operator AT&T and released in the US in November 2008.

After the big changes made to LG's top management team in 2008, it again made some changes during the following year. With CEO Yong Nam's content on the performance of the foreign top managers, LG recruited two new US citizens from outside of the firm as its new Chief of Human Resources and Chief Go-To-Market Officer. Through the recruitment of these new top managers and their broad range of both industry and job background, relations-oriented diversity remained at 2: medium diversity and task-oriented diversity at 3: high diversity. With the recruitment of these new foreign top managers, LG hoped to further strengthen its global-orientation and improve the way in which it brings its devices to the market. Through this, the firm hoped to be able to expand its presence in its various markets and reach its overall strategic goal of expanding its market share to 15 percent in 18 months.

With this goal fresh in mind, the firm announced good news in early 2009. Over the previous year, it had managed to sell 100 million mobile phones, boosting LG to the number three largest mobile phone producer and overtaking Motorola. For its innovation strategy, LG announced further plans to implement dual microphones in many of its future mobile phones in order to provide noise cancellation to improve the call quality of its mobile phones. Another innovation shown by LG was its innovative user interface, in which users could control the device's features with a 3D cube-based user layout of the controls. These two examples of new innovations show how LG's innovation strategy remained of high quality, by continuous innovation on all aspects of its mobile phones, all with the target of offering an improved user experience.

In the third quarter of 2009, LG reported further impressive results for its mobile phone division. Due to the recent decision to expand its product portfolio with new low-end mobile phones, the firm could capitalize on the growing demand in Asia. In contrast to most if its competitors who saw sales declining during 2009, LG boasted a welcome 9 percent growth in sales during the year. In addition to its increase in sales, LG managed to reduce its expenses and therefore increase its profit margin per unit sold. For a large part, this was thanks to the appointment of Tom Linton, Didier Chenneveau as new top managers in 2008, who were, thanks to their previous job experiences, able to increase efficiency in both external and internal production process which led to a decrease in production cost per unit and a decrease in R&D investments to 18 percent of net sales (LG, 2008). Thus, the increase in diversity in job background which took place in LG's top management team in 2008 clearly started paying off as it boosted the firm's financial results.

Despite the firm's impressive results of 2009, CEO Yong Nam announced new changes to the top management team for 2010. In total, seven new top managers joined the top management team. While most new top managers replaced others who left the firm, several new positions were created which expanded the top management team as compared to earlier years. These new positions included the head of the Corporate Design Center and the Chief Customer Officer, which were now part of the top management team in an effort to strengthen the firm's focus on the needs of the customers. Another addition to the top management team came in the form of Bradley Gambill, who had two decades worth of top management consulting experience and would act as LG's new Chief

Strategy Officer. While the scores for relations-oriented diversity and task-oriented diversity did not change through these top management team changes, remaining at 2: medium diversity and 3: high diversity respectively, CEO Yong Nam had hoped these new top management positions would lead to an increased degree of task conflict within the top management team, as the specific tasks of several top managers now overlapped more than ever. Through this increased conflict, strategic decisions of higher quality could hopefully be made than before.

After the firm's great success as compared to its competitors during 2009, it released a new ambitious goal in 2010 of overtaking local rival Samsung to become the world's number two mobile phone producer by 2012. Much of this aimed growth in market share would come from the smartphone market segment, which was growing rapidly in 2009 and the beginning of 2010. In order to offer competitive products in this market segment, CEO Yong Nam announced the firm would release 20 new smartphones by the end of the year. Interestingly though, was the decision to base these smartphones on the Android operating system. While LG joined the Open Handset Alliance, pioneered by Google, to develop and use the new Android operating system in 2007, it had not used Android in a single device yet. As the firm struggled to sell Windows Mobile based smartphones, smartphones using Android produced by the firm's competitors saw a huge demand. LG's top management therefore made the decision to focus its smartphone development around the Android operating system in an effort not to fall too much behind in this market segment.

Unfortunately for LG it did fall behind its competitors due to its late adoption of Android, causing its market share to slip slightly to 10 percent. While LG had profited greatly in the past from its policy of early innovation, it failed to innovate in the smartphone market segment for which CEO Yong Nam was held accountable. Because of this, the decision was made to replace Yong Nam with Bon-joon Koo, again an insider to LG, as the firm's new CEO. In order to speed up the product development of its new mobile phones, LG made changes to its organizational structure that would create a separate vertical unit for the mobile phone business. This move would separate mobile phone development from other divisions in the firm, hopefully decreasing the amount of hampering conflict between different business divisions.

In December 2010, LG seemed to get back on track with its cutting edge policy on innovation. Utilizing the previous job experience of fresh Chief Strategy Officer Bradley Gambil in the definition of innovation and technology management strategies, LG successfully returned to its philosophy of early innovation of just a few years earlier. On the 16$^{th}$ of December, it released the new Android-powered Optimus 2X, which was seen as a breakthrough product in the mobile phone industry. The Optimus 2X was the world's first mobile phone with a dual-core processor. In theory, this new processor could lead to a great increase of processing power while at the same time being more energy-efficient, meaning that more powerful software applications could run on the Optimus 2X than on other mobile phones available at the time without the battery depleting faster.

## *7.1 Influence of the moderators*

While the story of LG's mobile phone division of between 2002 and 2010 looks like a great success, we must also look at the moderating variables in order to understand why LG's top management team was able to define such successful innovation strategies.

### *Communication*

The moderator of communication has appeared to be a very important factor in the success story of LG's. Over the years, LG continuously stressed open communication between its top managers, in order for them to frequently share their problems, ideas, visions for the future and options for strategic decisions. Through this open communication, LG's top management team was able to use the diverse knowledge available within its team to come up with innovation strategies that indeed allowed the firm to grow and work towards achieving its strategic goals. In addition to communication within the top management team, the case of LG also shows the important of communication throughout the rest of the firm. In this case, the top management team consciously and clearly stated its goals for the future and strategies how to get there. This way, all employees in the firm new exactly where the firm was headed and could communicate their own ideas and suggestions to other, higher ranked employees in the firm. Another example of useful communication comes from this case when we look at communication with the outside of the firm. As described, LG deployed a very open policy on innovation, using extensive cooperation, and therefore communication, with network operators as well as consumer focus-groups. This type of communication therefore enabled the top management team to not only utilize its own knowledge in defining its innovation strategies, but also knowledge present in these other actors in the mobile phone market.

Unfortunately, though, the addition of several foreign top managers during 2008-2010 started to present a problem. While CEO Yong Nam stressed the importance of becoming a truly globally-oriented firm, this did not happen without struggle. As the non-South-Korean top managers entered the firm, they faced cultural differences which resulted in lower ranked employees often not communication to them extensively, and when they did, often through the use of an interpreter. This thus formed a barrier to the open communication that was present before these non-South-Korean top managers joined the firm.

### *Competence-based trust*

The moderator of competence-based trust also played a key role in the success of LG during 2002-2010. As explained, the vast majority of top managers during this time entered the top management team after an extensive career in the firm. Therefore, these top managers had proven not only their management and strategic decision making skills, but very specific to the firm LG itself. As they had worked their way up through the firm and proven their capabilities, employees both in the lower levels of the firm as well as in the top management trusted the top managers' competences. Indeed, this high degree of competence-based trust resulted in the fact that within the process of defining innovation strategies, the different top managers felt comfortable challenging each others' views and opinions. Thus, this moderator indeed positively influenced the relationships between the diversity, the mediators and the innovation strategy defined by the top management team.

When the foreign top managers joined LG though, they initially received a lower degree of competence trust as indicated by them in several interviews. As they entered the top management team from outside of the firm, employees of LG questioned their competence of making the right strategic decisions. Even though these new top managers had years of experience in top management positions, most of them got this experience in different industries which resulted in the questioning of their competences of making such important decisions in such a high-tech firm that

was LG. However throughout their top management team tenure, they received a higher degree of competence-based trust that initially after each of them proved his value and competences for the firm.

***Power struggle***

Little evidence of power struggle can be found for LG throughout the period 2002-2010. As explained, the different top managers received a high degree of competence-based trust which led them to trust one another with their specific tasks. Because of this absence of a power struggle and the even distribution of decision making power, the top management teams throughout the years could focus their attention on their important job of defining the corporate strategies, instead of having to worry about counterproductive conflict within the top management team. They were therefore highly successful in using the knowledge that existed in the top management team to define successful innovation strategies.

## *7.2 A summary of the analysis*

What is very remarkable for the case of LG is that, during the beginning of this research, its top management team did not show high degrees of diversity and a low degree of task conflict. As all of its members were South-Korean males in 2002-2007 and born in roughly the same timeframe, relations-oriented diversity was low. Much of the firm's success over the years however can be attributed by the degree of task-oriented diversity that existed within the various top management teams. What is particularly striking is the difference in top management team tenure and firm tenure of LG's top managers. While the average top management team tenure was rather low, most of LG's top managers had been with LG for the majority of their careers. This meant that the majority of LG's top management team had worked themselves up the organizational ladder within LG's different departments, getting to know LG very well in the meantime. Because of this, LG's top managers were well aware of the culture within LG and its methods of operation, while at the same time providing fresh new perspectives within the top management team. This significant difference between top management team tenure and firm tenure thus enabled LG to continue to define the right innovation strategies that it needed so much in accomplishing their prior set goals. In 2005 though, LG's success seemed to come to an end. With most of the market growth coming from the low-end, LG was badly placed with its high-end, premium devices. In order for the firm to still reach its ambitious goal of doubling its market share in two years, LG decided to focus on GSM-based mobile phones instead of those using CDMA.

This decision did mean a vast strategic challenge though, as the European GSM-based markets were very different from the US CDMA-markets. As the European network operators had little power compared to their US equivalents, developing mobile phones for network operators would likely prove unsuccessful in Europe. Therefore, LG needed to change its innovation strategies to focus development on the end consumer instead of the network operator. Fortunately for LG, almost all of its top managers had several years of international working experience, through which they had gotten to know LG's various markets. This international experience thus provided LG's top management team with the right knowledge of the differences in the various international markets, and ways for the firm to deal with these differences. In order to expand its European operations, the firm stuck to its very cooperative-driven policy on innovation by working together with other firms such as design house Prada in order to develop new mobile phones that would appeal to the

European consumers. Through this extensive cooperation and other partnerships, LG was able to remained on the cutting edge of innovation and continuously update its innovation strategies to assure their high quality.

When the smartphone market started growing at an exponential pace, LG was unable to produce a competitive device fast enough which resulted in disappointing results for the firm. As a result, the CEO was replaced by Yong Nam who started some major changes in the firm. While most of the firm's top managers used to come from within the firm after years of service, Yong Nam decided to expand the top management team by adding new, foreign top managers who came from outside the firm.

The reason behind this decision was to turn LG into a truly globally-oriented firm as well as to incorporate new perspectives in the strategic decision making process to improve the quality of the strategic decisions. These new top managers had background previously unrepresented within the firm's top management team, and through the high degree of task conflict were indeed able to influence the future vision of the firm and the innovation strategies as defined by the top management team.

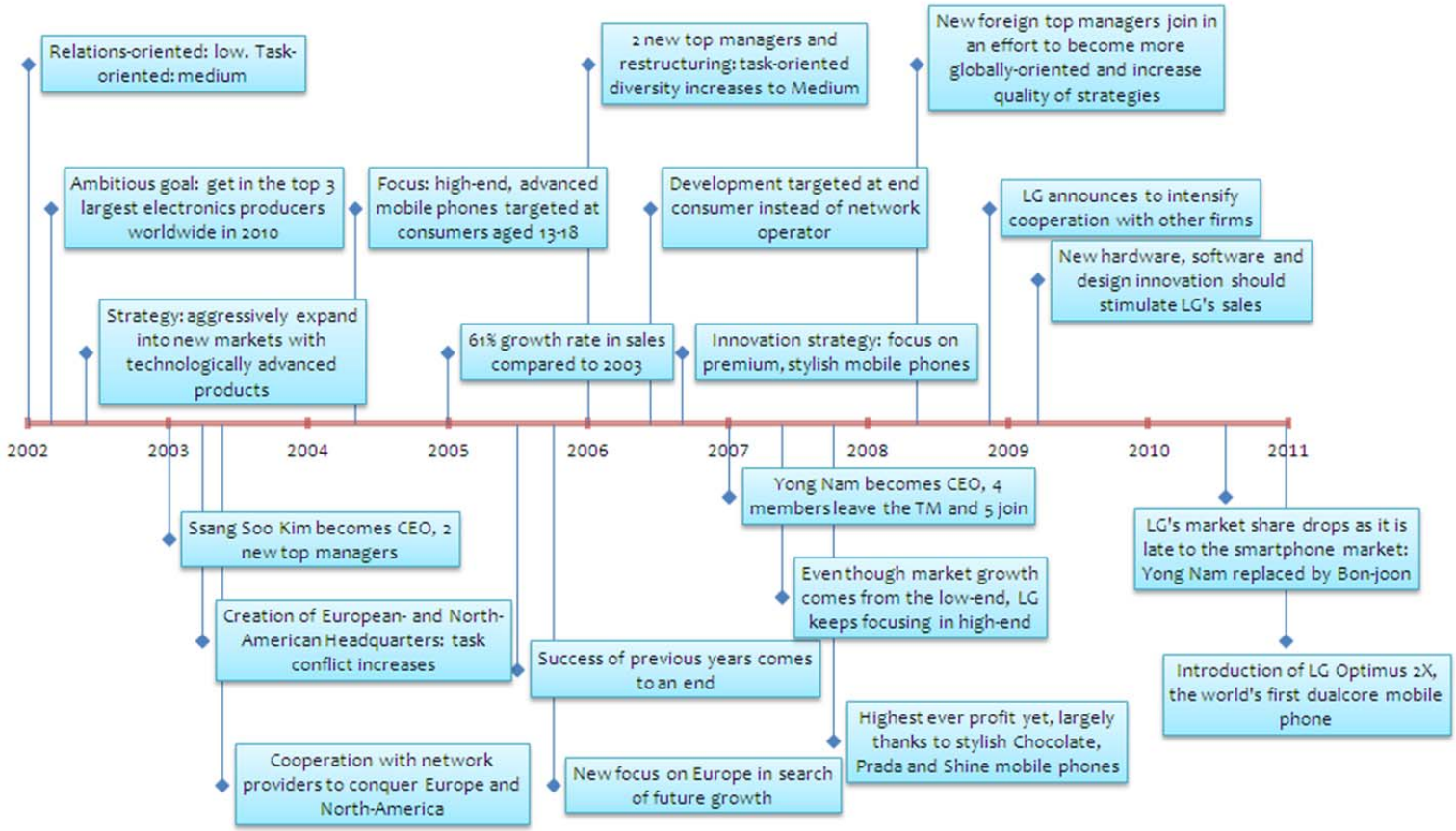



**Figure 9: A timeline showing important events for LG between 2002-2010**

# 8. Between-case analysis

This eighth chapter will compare the results from the previous chapters and will thus be a between-case analysis. By carrying out this analysis, any differences in the findings that may have arisen from the three previous within-case analyses will be discussed and possible explanations as to why these differences exist will be given.

By comparing the results from the three separate within-case analyses, efforts can also be made to generalize these findings to a broader range of firms and industries.

## 8.1 Effects of diversity

In this paragraph, the question how the different indicators of diversity can influence the three mediators and ultimately the innovation strategy will be answered, thus providing the answers to sub-questions 1,2 and 3 as presented on page 7. This paragraph will be divided into two sub-paragraphs, in which all indicators of both relations-oriented diversity as well as task-oriented diversity will be dealt with. For each of these indicators, the specific relationships with the mediators as well as the innovation strategy as explained in the theoretical framework are discussed. By aggregating the evidence from the three within-case analyses, a complete answer as to how each specific indicator has influenced the relationships as suggested in the theoretical model can be presented.

The findings suggest that indeed, diversity has a very big influence on the mediators and the innovation strategy. To be more specific, intra-personal as well as inter-personal diversity in the indicators related to task-oriented diversity seems to be very important for the top management team to be able to define successful innovation strategies. This means that both diversity within the task-oriented diversity indicators of a single person (e.g. diverse job background of a specific top manager) as well as diversity between top managers (e.g. diversity in job background between top managers) has significant influence on the strategic decision making capabilities of the top management team.

### *8.1.1 Relations-oriented diversity*

**Gender**

During the analysis of each of the cases until 2007, no real relationship has been found as to how diversity in gender would influence one or several mediators or the innovation strategies of these firms. This is possibly due to the low degree of gender diversity for each of the cases in these years. However, if gender diversity increases for one or several cases in the years 2008-2010, a previously undiscovered relationship may come forward.

**Ethnicity**

Evidence has indeed been found that diversity in the ethnicity of top management team members influences the mediators and the innovation strategy. Especially in the case for LG, when it suddenly increased its ethnicity diversity, changes in its innovation strategy could be identified. However when looking at this relationship we must ask *why* this relationship would exist. The answer to this question is probably because diversity in ethnicity in these cases had very high correlation with other task-oriented indicators of diversity, such as industry background. What that means is that diversity

in ethnicity in itself may not directly influence the mediators or the innovation strategy, but that this relationship exists because the diversity in ethnicity also meant diversity in industry background and diversity in firm tenure. Again looking at the case of LG in 2008, diversity in ethnicity increased but it did so with a reason. While LG's top management team had been all South-Korean, its CEO realized that in order to be more successful in Europe and the US, LG's top management team had to have more knowledge on these markets, which it gathered by diversifying the ethnicity indicator of its top management team. Therefore, the resulting changes in its innovation strategy may not have come from the increased diversity in ethnicity, but rather because these new people had more knowledge and experience in these important markets.

**Age**

As with the previous indicator, evidence of a pure relationship between this indicator and the mediators or the innovation strategy has not been identified. Again, it seems that whenever a relationship may have been identified between this indicator and another variable, it was not purely due to diversity in age of the top managers. When looking at a case where diversity in age increases, this can only happen when one or several top managers leave the team and new people enter. This thus inherently means that a change in diversity in age correlates heavily with the indicator of top management team tenure.

The relations-oriented dimension of diversity thus seems to have had little effect on the mediators or the innovation strategies of the three cases studied. Only due to correlation with different task-oriented indicators did these indicators influence the other variables. Therefore, the notion in previous literature that relations-oriented diversity does not significantly influence a firm's innovation strategy is confirmed by these three cases.

### *8.1.2 Task-oriented diversity*

**Top management team tenure**

This indicator has been very influential throughout this research. For each of the cases, a significant change in diversity of this indicator very much influenced the mediators of future vision, policy on innovation and ultimately the innovation strategy. Indeed, it seems that diversity in top management team tenure gives the top management team both experience and intimate knowledge of the firm while at the same time incorporating a fresh perspective in the strategic decision making process. While the top managers who have been part of the top management team may have the most knowledge of the firm and experience in the definition of the strategies and therefore may seem the most capable, high top management team tenure often leads to a reduction in the questioning of the fundamentals of the defined strategies. We see this when new top managers enter the team, and diversity in this indicator thus increases, that changes made to the innovation strategies as well as the mediators are not only changes in details, but also some very fundamental changes. An example of this is the appointment of Ed Zander as the CEO of Motorola at the very end of 2003. While this did not immediately mean a strategic 180°, his joining of the top management team did have a very profound effect over the next year. While the innovation strategies before that time largely focused on technological aspects of the mobile phones, Zander questioned whether that fundamental focus was effective and did indeed result in new devices providing a user experience of as high a quality as possible. This very basic questioning eventually led to a fundamental change in Motorola's

innovation strategy, when it shifted its focus from technology to software in search of user experience improvement.

In line with this example, the indicator of top management team tenure also seems to have clear influence on the policy on innovation of a firm. As developments within these three case studies have shown, a firm in which average top management team tenure is rather high with low diversity is inclined to take a more conservative approach to innovation. A likely explanation to this phenomenon is that when a certain innovation strategy has proved successful in the past, a top management team is often inclined to continue the same approach on innovation and turn down any strategies that seem too risky in their eyes. However, with this industry developing in such a rapid pace, taking a conservative approach may prove risky in itself this increases the chance of the firm losing competitiveness compared to other firms in the industry which take a more cutting edge approach to innovation.

What has to be noted though is that not all examples of increased diversity in top management team tenure have been as that of Motorola described above. Very important to the impact of an increase in this diversity is the distribution of power between the top managers. While Ed Zander was CEO, he was of course a very power and influential figure within Motorola's top management team, and the entire firm, at the time. However if he was appointed to a less-powerful position within the top management team, his visions and ideas about the focus of the innovation strategies would likely have had less effect. In addition to this, one must not only look at the amount of diversity but also at the way in which this diversity is distributed. What this finding means is that the degree of diversity is not the only thing that matters, the way in which this diversity is spread is also important. The figure below illustrates two top management teams: both with a high degree of diversity, but the first with an even spread of this diversity and the other much more unevenly spread.

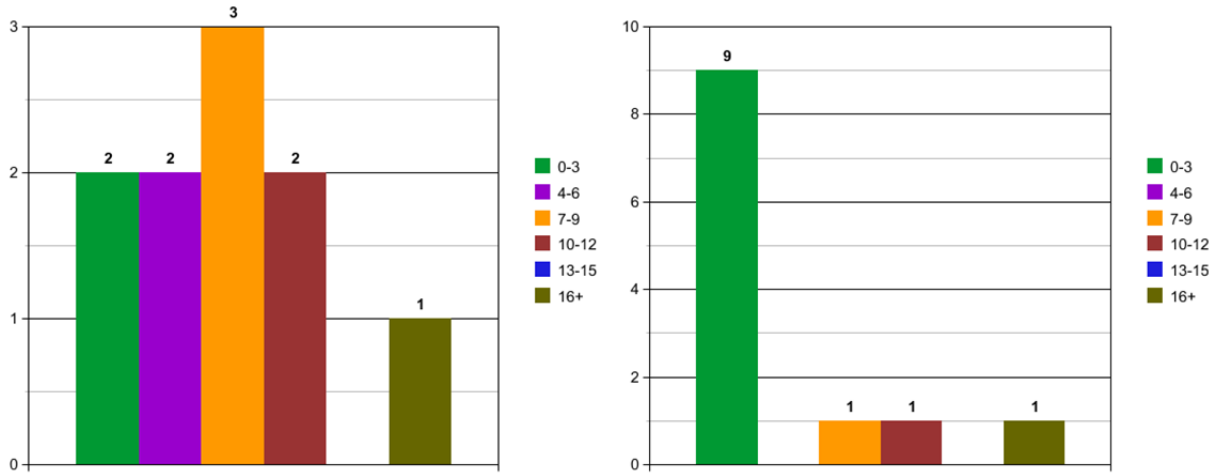



**Figure 10: An example of the spread of diversity for a given indicator**

Very high diversity in top management team tenure may seem positive, but large gaps in this tenure should be avoided. When looking at the case of Nokia, diversity in top management team tenure was high but not evenly distributed over time. This meant that there was one group of people who were relatively new to the top management and one group who had been there for a very long time. Unfortunately for Nokia, this stimulated the formation of sub-groups which hindered the strategic decision making process.

**Job background**

From the three cases studied in this research, diversity in job background does indeed seem to have its influence on the mediators as well as the innovation strategy. Each of the within-case analyses carried out in this research supports the idea that a greater diversity in job background of the top managers positively influences the mediators and in turn the innovation strategy. For the case of LG, for example, we see that even though most top managers had very high firm tenure and therefore almost no experience working for other firms, they had very different jobs throughout their careers with LG. This diversity in job background stimulated LG's top managers to not only look at the mobile phone industry from a single perspective, let's say that from an engineer, but include many different perspectives in the search for, and definition of, a future vision, policies on innovation and a clear innovation strategy. Indeed, diversity in this indicator can relate both to intra-personal diversity as well as inter-personal diversity. This means that the diversity in job background of a single person as well as diversity in job backgrounds between persons has a significant influence in the relationships as suggested during this research. More examples like this, for instance the increase in job background diversity in Nokia's top management team in 2010 when Stephen Elop became CEO, supports the idea that diversity in this indicator is positively related to the mediators and the innovation strategy.

**Firm tenure**

This indicator has proven very influential on all mediators and in turn the innovation strategy. However, evidence of the three case studies may seem to contradict. While low diversity in firm tenure (high average tenure) had proven disastrous for Nokia, roughly the same degree of diversity was positive for LG. The explanation for this can be given by looking at the specific situations these firms found themselves in and the attitudes of the top managers towards the mobile phone industry. For Nokia, high average firm tenure with low diversity had a negative effect on its innovation strategy because in the beginning of the time period studied, it found itself in a very comfortable position. However, as the industry changed, the low diversity in firm tenure of some of the most influential top managers prevented the top management team from responding to these changes as they were inclined to continue along the same path they were used to and felt comfortable with. Especially since the short-term threat of a changing industry did not seem significant at the time, Nokia's top management team had the ability to continue its policy on innovation, its future vision, and ultimately its innovation strategy.

For LG on the other hand, the situation was very different. LG was already a strong firm within its homeland of South-Korea, but was a latecomer to the US and European mobile phone markets. Therefore, in order to penetrate these markets successfully, it had to create a new strategy to conquer these markets from scratch. The low diversity in firm tenure with exceptionally high tenures probably was beneficial to LG at this time. Its top management team had great knowledge of and experience within the firm. Therefore, LG's top management team knew all too well about the firm's strengths and weaknesses and at the same time could look at the US and European markets from a fresh perspective. This was also helped by the international experience of many of its top managers. While they all served LG for a long time, many of them had international experience by working for one of LG's many branches outside of South-Korea for several years. This gave LG's top management team added insight into the markets it was now trying to enter.

It thus appears that this indicator can have a significant effect on a firm's innovation strategy but that this effect can be both positive as well as negative. While these ambiguous results make seem like a disappointment, the differences can in fact be explained by the specific situation a firm finds itself in, thereby providing new insights in the relationship between this indicator and innovation strategies. In Nokia's case, the firm had been highly successful leading to a feedback loop which decreased the motivation of its top managers to critically evaluate the firm's future vision, policy on innovation and innovation strategy. Thus, the success many of its top managers had experienced led them to be smug and continue innovating along the same lines the firm had been doing over the years. For the case of LG, however, the firm wanted to expand its operations into Europe and the US. In this specific situation, the firm could benefit from the knowledge the top managers had both of the firm as well as of the markets it was now trying to conquer to define innovation strategies of high quality and with great speed to enable itself to indeed be successful in these new markets.

**Industry experience**

Evidence of all three cases has shown a relationship between diversity in industry experience and the mediators as used in this study. Looking at the case of Nokia and how it gradually lost its competitive position during the years examined in this research, industry experience may be an important factor in explaining this decline of success. Traditionally, Nokia relied heavily on its own employees, often joining the firm fresh out of university and being promoted up the firm over the years. However as Nokia was only active in a small number of industries, this automatically meant that many of its employees also had limited experience in different industries. As the mobile phone industry changed during these nine years as the design and software aspects became more and more important, having a limited number of employees with experience in design and software oriented industries proved to be a problem for Nokia. This problem did not only occur at the lower levels, but also within the top management team where many of its top managers did not recognize the changing market and did not come up with a timely response for the firm.

While it may seem that the example given above is related to the variable of firm tenure, differences emerge when including the case of LG. As for Nokia, LG had very low diversity in firm tenure with most of its top managers having worked for the firm for the vast majority of their professional lives. However, with LG being active in a great range in different industries, LG's top managers had important experience in industries in which design and software had already been very important factors. This broader industry experience of LG's top managers as compared to those of Nokia allowed LG's top management team to respond earlier and more effective to the changing industry than that of Nokia.

Overall, we can thus conclude that due to the increasing complexity of the mobile phone value chain and the growing importance of design and software over the years, the three firms (could) have benefited greatly of having top managers with multi-industry experience.

## *8.2 Mediators influencing each other*

As was stated in the introduction of this research, a research gap currently exists as to how the suggested mediators not only influence the innovation strategy, but also how they influence each other. Therefore, this paragraph will go deeper into these possible relationships and in doing so will provide an answer to the fourth sub-question of this research: *How have the mediators of task*

*conflict, future vision and policy on innovation influenced each other for the cases of Nokia, Motorola and LG?*

**Task conflict**

The variable of task conflict is the first mediator included in this research. As stated in the literature given in the theoretical framework chapter, the presence of task conflict within the top management team is regarded as vital in order to benefit from diversity within this team. Indeed, the three cases studied in this research all support this suggestion. In the case of Motorola in the beginning of this research, we see that task conflict between its top managers was rather low due to the low overlap in the specific tasks of the top managers. Because every top management had such a distinctive task, there was very little stimulus for the top managers to share their perspectives and opinions concerning the innovation strategy of the firm. Therefore, even though there was diversity between Motorola's top managers which theoretically could have positively influenced its future vision, policy on innovation and innovation strategy, the benefit of this diversity was not exploited. In the case of LG on the other hand, task conflict was increased significantly throughout the timeframe 2002-2010. As the firm created new headquarters for among others Europe, the US, China, the specific tasks of the different top managers started overlapping more and more. Because of this increased degree of task conflict, LG could indeed exploit some of the benefits from having different perspectives on the mobile phone industry which came from the diversity between its top managers.

Examining the task conflict for each of the cases, the notion from literature that it is a very vital variable in the ability of a firm to benefit from diversity is indeed confirmed. In the case where task conflict is very low, unique visions and ideas for both short- and long-term developments are hardly shared throughout the top management team. However, as the degree of task conflict increases, the tasks of the different top managers will partly overlap which means they will be stimulated to share their ideas and opinions. This first mediating variable does therefore indeed very much influence both other mediating variables: future vision and policy on innovation. Especially in a firm active in multiple different industries, such as Motorola and LG, stimulating task conflict within the top management team can have a profound influence on the firm's future vision and policy on innovation as different departments, at the top level, are encouraged to work with each other instead of next to each other.

However, a high degree of task conflict can also be negative. Especially in an industry in which developments happen at such a rapid pace as they do in the mobile phone industry, strategic decisions have to be made with certain urgency as well. While task conflict is thought to stimulate the quality of the strategic decisions, it can negatively influence the speed at which these decisions are made. Indeed, in the case of Nokia, its high degree of task conflict did affect its

**Future vision**

The second mediating variable is that of the future vision as described by each firm's top management team. As already indicated, this future vision was indeed significantly influenced by diversity within the top management team. However, this future vision in turn also significantly influenced the policy on innovation as defined by this team. What we can see for each of the cases is that whenever a fundamental change in the future vision took place, this translated into clear changes in the policy on innovation as well. When looking at LG for example, its future vision changed when it started looking for new markets, i.e. Europe and the US, for growth. While the firm

had been very successful in its homeland of South-Korea due to high-end, advanced products focusing development on technological improvements, it significantly changed its vision when it targeted the European and US markets. For the firm to be successful in these markets, it created a vision of establishing LG as a premium brand not only by focusing on technology, but very much on design as well. This changed vision led to a change in the firm's policy on innovation, as its top management team now actively sought cooperation with some of the world's top designers to help LG create stylish and attractive mobile phones that would help it successfully grow in these markets.

Similar examples can be given from the other two cases as well, meaning that indeed this research has identified a clear relationship between the mediators of future vision and policy on innovation. A future vision that has significantly changed often leads to a policy on innovation in which the firms become more positive towards cooperation with other firms and especially seek cooperation for new purposes that align with its new future vision.

**Policy on innovation**

The firms' policies on innovation have been included in this research as the last mediator. As explained above, a relationship has been found between the variable future vision and policy on innovation where a change in the future vision of a firm leads to a change in its policy on innovation. However, this relationship may not be a one-way street, but rather a firm's policy on innovation can in turn influence its future vision as well. The best example for this relationship can again be seen in the case of LG. When the firm first entered the US market, it used active cooperation with the present network operators to develop new mobile phones. Through this active cooperation, LG was very aware of the aspects of a mobile phone that would make it successful and it could sign agreements with these network operators to give these operators exclusive rights to some of LG's latest mobile phones. However, this policy on innovation did not only affect LG's short term innovation strategy. With the information about the US network operators' needs as well as those of the local consumers, LG's future vision started changing as well. While it had been so much focused on incorporating the latest technology in its mobile phones for South-Korea, the information it gathered from the US made the top management team realize that internationally, competition was shifting away from purely technology. This information, which the firm gathered through its cooperative policy on innovation, made it re-think about how the industry would develop further. Through this, its future vision included a longer time span and the notion began to emerge within the top management team that, in the mobile phone industry of the future, the technology incorporated in a mobile phone would be regarded as less important than its software.

## *8.3 Influence of the moderators*

This paragraph will briefly discuss the influence of the suggested moderators on the relationships between top management team diversity, the mediators and the innovation strategies of the three cases which have been studied during this research. Due to the scope of this research explained in the introduction chapter however, the moderators have been investigated in lesser extent and description on them will be somewhat shorter than in the previous paragraphs.

**Communication**

The concept of communication was the first moderator included in the theoretical model. As stated, this moderator is thought to have a profound effect on the relationships described in paragraphs 8.1 and 8.2. Evidence from the three case studies does indeed reveal the importance of clear

communication between the top managers of these three mobile phone producers. Especially the case of LG shows how extensive communication between top managers positively increases the strategic decision making process. Through this communication, LG's top managers could easily share their strategic visions and ultimately reach consensus on the innovation strategy to follow. This consensus, due to communication, has proved very valuable in avoiding power struggle within the top management team. Additionally, though, the case of LG has shown the importance of communication not just within the top management team, but also throughout the rest of the firm. During the years, LG's top management team established very clear and ambitious goals for the future. It consciously communicated this vision throughout the firm though, and to the press, to make sure every LG employee was aware of the firm's strategic goals and plans for the future. This, in turn, enabled a useful feedback loop in which lower ranked employees could comment on the strategic goals and present higher levels with ideas and suggestions as to how the firm could accomplish those goals.

From the other two cases, those of Nokia and Motorola, we find evidence of how the moderator of communication can be negatively influenced by some of the included indicators of diversity, and how this moderator itself can have negative effect on the mediators as well as the innovation strategies. In both these cases, sub-groups within the top management teams had formed due to an uneven spread of diversity in these different indicators as explained in paragraph 8.1. As stated, at different times, diversity in top management team tenure was high for these cases but this diversity was unevenly spread across the years. For example in the case of Nokia, there was one sub-group with high tenure and one sub-group with low tenure within this top management team. Whenever such sub-group formation took place, this negatively influenced communication throughout the top management team. Members of sub-groups were inclined to communicate within these groups, and limit communication with the rest of the top management team. Because of this, the different perspectives of the top managers possibly had to offer during the strategic decision making process was not used effectively. Thus, this sub-group formation negatively influenced the moderator communication, which in turn negatively influenced the variables between the mediators and the innovation strategy.

**Competence-based trust**

Mostly related to firm tenure. Whenever someone from within the firm enters the top management team, he or she usually receives a higher degree of competence-based trust as compared to a top manager who comes from outside of the firm. An example of this is the case of Nokia, where Stephen Elop became CEO in 2010. Mr. Elop was previously a Microsoft employee, where he headed the Business Division. However, he received a lower degree of competence-based trust because of several reasons. Firstly, people both from within Nokia as well as outside the firm suggested that Microsoft had made plans to buy Nokia in an attempt to boost the success of its new Windows Phone 7 operating system. Because Stephen Elop was a former Microsoft employee, people feared that in such a possible selling of the firm, he would be biased and make decisions not just in Nokia's best interest but also with that of his former employer in mind. Additionally, while Stephen Elop had significant experience both as a top manager and in the computer software industry, he had no prior experience in the telecommunications industry. Therefore people had a lower degree of trust in his abilities to turn around the dropping success of the telecommunications giant that was Nokia.

This low degree of competence-based trust could negatively influence the strategic decision making process. With people openly questioning his abilities to make the right strategic decisions as Nokia's CEO, the chance of power struggles emerging increased. Other top managers were inclined to seek an increase of their own power within the strategic decision making process, as serious doubts were raised as to Stephen Elop's decision making abilities.

**Power struggle**
The third and final moderator used in this research is that of power struggle within the top management team. This moderator relates to the question to what extent there is any struggle in this power distribution. It is very much related to the other two moderators and like them, is positively stimulated by sub-group formation within the top management team as well as a low degree of competence-based trust among top managers.

In the case of LG, we see that decision making power was very much evenly distributed among the top managers without any signs of struggle. This even distribution of power meant that in the process of defining the innovation strategies, all top managers could share their views and opinions to ultimately come to an innovation strategy which was supported throughout the top management team. In the case of Nokia in 2004 however, we see that there was indeed evidence of a power struggle within the top management team. In this case, there were clear signs of sub-group formation with the notion of "Jorma's gang". This sub-group formation led to a power struggle, in which both sub-groups wanted to expand their influence in the strategic decision making process. This struggle then negatively influenced the strategic decision making capabilities of the top management team, due to the increased amount of unproductive conflict between the top managers. While it has been argued that conflict can have a very positive effect within the top management team when defining new strategies, this type of power struggle related conflict only hampers the process by decreasing the speed at which the innovation strategy is defined.

## *8.4 Additional findings*

After analyzing all three cases, many similarities and differences have been found which have revealed relationships between several of the variables which studied throughout this research. However three important additional findings have to be included in this report which were not earlier suggested in the used literature.

Firstly, most of the used literature revolved around diversity within a great number of variables, this research has found that diversity *across* variables is also very important for a firm's ability to define successful innovation strategies. Very important insights for this idea came from the case of LG which was comparable to the other two in numerous ways, but also different in one crucial way. In LG most of its top managers had served the firm for over two decades, meaning that diversity in the indicator of firm tenure was low. However when examining LG's top management teams between 2002-2010, we can see that its average top management team tenure was actually rather low. As average firm tenure was high, and top management team tenure was low, this meant that there was diversity across these two indicators. Through the diversity across these indicators, LG's top management teams had the unique ability to respond to a changing industry timely and successfully, and coming up with innovation strategies that allowed the firm to report growth numbers higher than any of its competitors and work towards a realization of its future vision. By stimulating the diversity between these variables, LG had put together top management teams with intimate knowledge of the firm

and each of the industries the firm was active in, while at the same time continuously offering fresh perspectives that were needed to respond to the changing circumstances over the years.

The second new finding relates to the type of diversity that can be beneficial to the decision making capabilities of top management teams. In the literature which formed the theoretical foundation of this research, diversity was used to indicate differences *between* members of a particular team or group. For instance, the degree of diversity was determined by looking at the differences in job background of the top managers. However, evidence gathered during this research has shown that *intra-personal* diversity influences the mediators and innovation strategy as well. This means that, when taking job background as an example, one should not only look at the diversity in job backgrounds between different people. Rather, diversity in the job background of a single person is influential in the strategic decision making process as well. As indicated in the section on job background in paragraph 8.1.2, a person with a higher degree of diversity in job background in general has the benefit of being able to use different perspectives to look at a certain problem or opportunity. In practice, this means that a top manager who has had very different jobs in the past is generally able to spot more new opportunities and make more well-balanced strategic suggestions and decisions.

A third additional finding concerns the notion that the effect of diversity, and the degree to which diversity is beneficial or harmful to a top management team's capability of defining high quality innovation strategies, is highly dependent on the context of the firm. The results of this study have shown that there is no simple *one-size-fits-all* model for diversity which would maximize the strategic decision making ability of a top management team. Rather, the degree to which diversity is desirable seems to depend on the context variables such as the complexity of the products' value chain, the (changing) market complexity and the firm-specific context such as its size and number of industries it operates in. Related to this finding is the result that through a high drive for cooperation with other firms, top management teams can partially overcome any internal shortcoming in knowledge or experience. This means that, even when some knowledge which is important in the definition of an innovation strategy is lacking in a top management team due to a low degree of diversity, firms can use extensive cooperation with other firms to overcome such shortcomings. Firms with such an open policy on innovation are therefore less likely to suffer from a low degree of task-oriented diversity within their top management teams.

# 9. Discussion

This research, which has taken approximately nine months from start to finish, has revealed some interesting new insights into the relationship between top management team diversity and the innovation strategy defined by that team, as well as the mediating factors explaining this relationship. However, the findings of this research have to be critically examined to put into perspective and highlight any shortcomings.

First of all, one must be aware of the limited scope of this research. The findings of this research might be specific to the mobile phone industry, or rather specific to high-tech industries in general. In these kinds of industries, innovation occurs at a very high rate. As a result, firms in these industries are under pressure not only to come up with high quality innovation strategies, but also in coming up with these strategies at the right time. In lower-tech industries where innovative developments occur

at a slower rate however, this may be of less importance. In those industries, top management teams may have more time in coming up with innovation strategies that would allow the firm to accomplish its broader strategic goals. Therefore in those industries, conflict between the top managers may be even more desirable. After all, as this conflict increases decision quality but decreases decision speed, conflict may be more beneficial to firms operating in industries in which decision speed is of less importance. When comparing the mobile phone industry to lower-tech ones, the relevance of several indicators of diversity may also be different. As indicated in figure 1 in chapter 2 of this research, the mobile phone value chain is a very complex one. Having top managers with intimate knowledge of different areas in this value chain may therefore prove highly beneficial during the process of defining innovation strategies. For firms producing low-tech products with a much simpler value chain however, this diversity in knowledge may inherently be less important as there is simply less specific knowledge needed to base the innovation strategies on. Because of this possible difference of the relevance of the indicators of diversity, the findings of this research may be hard to generalize to such low-tech firms.

A second topic of discussion concerns the moderators used in this research, as they have been discussed only in little detail. Both due to the decision to limit the scope to the mediators as well as due to the document-dependent nature of this research, the influence of the suggested moderators has only been touched briefly. More research diving deeper into these moderators could prove interesting as it would complete the picture and reveal more information on the relationships suggested in the theoretical model.

The third element in this discussion also relates to the specific aim of this research. As stated clearly in the introduction, the aim was to identify how diversity in a specific top management team's characteristics related to the innovation strategy as defined by that team. While this aim has been achieved, the results of this research cannot automatically been translated into the success of these firms. After all, the execution of these innovation strategies, as well as other process within these firms, are also highly important in the overall success of the firm or even the actual results of its innovation strategies. For instance, a firm which defines an, in principal, high quality innovation strategy also has to carry this strategy out effectively and timely in order to translate the innovation strategy into a success. This should thus be kept in mind when reading the conclusions of this report. Further research could not only examine the innovation strategies as defined by specific firms, but also how they carry these strategies out. Those results would answer the question how diversity in top management team characteristics influences the overall innovative capabilities and direction of a firm.

The fourth element of the research which could be subject of discussion is the use of the upper echelon theory itself. One might argue that this theory is rather restricted as it is very much focused on the top management, and may pay too little attention to lower levels within the organizational structure or global industry/economic developments. Especially in big firms such as the three cases used in this research, lower levels of management may take over some of the traditional responsibilities of the top management team. Therefore, some strategic decisions concerning the innovation strategies may not be made solely by the top management team, but at least partly by these lower levels of management. However, the creators of the upper echelon theory have countered this argument themselves. As they state, the top management team does not just assign resources to decisions made in the lower levels of the organization. Rather, top managers are very

important actors who are very much involved in the essential strategic decision making process, and their backgrounds are very much determinant of the strategic decisions they make (Hambrick & Mason, 1984).

Indeed, the findings of this research confirm the suggestions in earlier literature that diversity within top management teams influences firms' innovation strategies. Additionally, the three mediators gathered from literature on innovation do indeed provide much explanation as to why this relationship exists. For the mediator of task conflict, the 'inverted U-shape' found in earlier literature (De Drue, 2006) was indeed confirmed during this research. As suggested, top managers within a top management team with a low degree of task conflict are not inclined to actively cooperate with each other but rather work next to each other due to their very distinct tasks in the top management team. Very high task conflict however is also counter-productive, as this often leads to a slow decision making process which is detrimental in such a rapidly developing industry. Evidence of these three cases does thus confirm the notion of an optimum amount of medium task conflict in which tasks of different top managers partially overlap. Due to the findings of this research, it shows little signs of conflict with earlier literature on diversity or innovation management. It does provide new and deeper insights though, among others through the additional findings of the relevance of diversity across variables as well as the importance of intra-personal diversity in the indicators of industry background and job background. Also, by diving deeper into the relationships between the mediators themselves, this research has provided a clear and useful contribution to literature on innovation management as well be discussed in the next chapter.

# 10. Conclusions

As described early on in the introduction chapter of this report, the main goal of this research was to gain deeper insights into how and why diversity within top management teams can influence the innovation strategies of those firms. The specific firms chosen as the objects of study are Nokia, Motorola and LG, which are mobile phone producers. As innovation occurs at such a rapid pace in this industry, it is vital for these firms to keep up with the industry in order to remain competitive. In order to successfully reach the research goal outlined above, several mediators have been identified using literature on innovation management. These mediators were thought to provide the underlying reason as to why diversity within top management teams would influence innovation strategies. Based on these mediators, four different sub-questions have been defined in the introduction that formed the backbone of the analyses carried out in chapters 5 through 8. By gathering an abundance of publicly available information on the three cases, the Qualitative Content Analysis method could be used to answer the sub-questions throughout these chapters and ultimately answer the central research question: *How does diversity in top management characteristics affect the innovation strategy of mobile phone producers?*

Overall, the outcomes of this research relate very well with previous literature on innovation as well as top management diversity. Based on this previous literature the two dimensions of diversity, relations-oriented and task-oriented, were used throughout this research. As expected, there was a clear difference in the way in which the indicators belonging to these dimensions influenced these firms' innovation strategies.

Diversity in the indicators gender, ethnicity and age, belonging to the relations-oriented dimension of diversity, did indeed seem to affect the strategic decisions made by the top management teams as examined in this research. However, it is likely that these indicators only affect the strategic decision making process only if this relations-oriented diversity leads to task-oriented diversity. As suggested in literature (Ensley et al, 2002; Tacheva, 2007) and confirmed by findings in this research, the indicators belonging to both dimensions of diversity are often very much correlated, for instance when diversity in ethnicity offers the top management team greater knowledge of different international markets. Therefore it is through the occurrence of this correlation, that relations-oriented diversity influences the mediators and the innovation strategies of firms. The relationship between the relations-oriented indicators and the mediators and innovation strategies can therefore be seen as indirect, in which the task-oriented indicators actually form mediators explaining this indirect relationship.

As for the important task-oriented indicators, top management team tenure, job background, industry background and firm tenure, evidence from all three cases supports the suggestion in earlier literature that diversity in these indicators can have a positive influence on the innovation strategies as defined by a top management team. By conducting these three case studies deeper insights into the way in which these indicators influence the innovation strategies have been developed. The notion that the three mediators task conflict, future vision and policy on innovation are very much influenced by the backgrounds of the top managers of a firm is supported by all three cases. From these case studies, results have shown that diversity in these indicators improves the capabilities of a top management team in coming up with an innovation strategy that enables the firm to reach its overall strategic goals.

A top management team with a higher degree in top management team tenure and firm tenure enables itself to have an extensive amount of knowledge of the specific firm as well as the industries it is active in, while at the same time stimulating fresh perspectives in the strategic decision making process. Through this diversity, these top management teams seem better capable in defining the right innovation strategies, by use of positive task conflict, formulating clear future visions and supportive innovation policies. However, large gaps in both these tenures should be avoided. As found during this research, large gaps stimulate the formation of sub-groups which negatively affects communication throughout the top management team and stimulates to occurrence of unproductive conflict. Therefore, diversity in these indicators should be rather evenly distributed to be of positive influence in the strategic decision making process.

The second set of indicators of this dimension, job background and industry background, are also related to each other. As the mobile phone value chain has become increasingly complex, having a deep understanding of the total value chain is vital for the top management team to be able to define the right innovation strategies. Therefore, diversity in industry and job background of a top management team can ensure that team to collectively possess extensive knowledge of all aspects of the mobile phone value chain. As assumed, low diversity in these two indicators has indeed been shown to negatively influence firms' innovation strategies throughout this research. Whenever the different top managers of a firm have very comparable industry and job backgrounds, they are often inclined to formulate strategies that adhere closely to their backgrounds. However, in such a complex and rapidly evolving industry in which these mobile phone producers find themselves, such a limited view can be detrimental to the firm's success. As found, a greater amount of diversity in these

indicators enables the top management team to be receptive of a greater variety of opportunities and threats and formulate future visions, policies on innovation and innovation strategies accordingly. Indeed, these top management teams have been found to define innovation strategies that better enable the firm to reach its strategic goals and realize its visions.

A very important finding of this research is also the notion that the effect of top management team diversity on an innovation strategy is very much dependent on both the context of the firm as well as the overall industry. While previous quantitative research on the influence of diversity on firms' strategies could not incorporate the notion of this context, the results of this research support the idea that the effects of top management team diversity are influenced greatly by a set of context variables. As explained, the results of this research have proven the complexity between top management team diversity and a firm's innovation strategies.

In general, the findings of this research have been very supportive of the suggestions in earlier literature as to how and why diversity in top management team characteristics could influence a firm's innovation strategy. The variables that, based on previous research, have been included in the theoretical model presented in figure 3 have been found to offer much explanation as to why and how these firms have defined their innovation strategies. Especially the task-oriented indicators of diversity provide a great deal of explanation as to why a certain top management team defines innovation strategies as it does. This relationship has been found to be dependent on three very important mediators: task conflict, future vision and policy on innovation. As diversity within top management team changes, this often affects these three mediators. Each of these three mediators has been found to influence each other, meaning that there are two-way relationships between each of these mediators. In turn, changes in these mediators lead to changes in the firm's innovation strategies.

Overall, evidence from the cases Nokia, Motorola and LG suggests that a top management team functions optimally with a medium degree of diversity in top management team tenure and firm tenure. In addition, diversity in industry background and job background have been found to be very positive for these firms to define high quality innovation strategies, especially diversity related to the different aspects of the mobile phone value chain. Through this kind of diversity, the top management team has the right knowledge to identify and explore any opportunity that could be relevant to the firm and would lead to competitive advantage if exploited successfully.

## *10.1 Generalization and implications*

The conclusions as described in the beginning of this chapter do not only concern the three cases studied in this research, but can also be partially generalized to other firms and industries.

Firstly, the mobile phone industry is a highly competitive one in which the value chain of the products is highly complex. Because of this complex value chain, firm's with a higher degree of task-oriented diversity (i.e. top management team tenure, industry background, job background and firm tenure) seem to be able to define higher quality innovation strategies than teams with a lower degree of this diversity. In general, firms are thus advised to look closely at their top managers and the task-oriented diversity that exists between them. Of specific importance are the value chains of the products the firm develops. After the different aspects of the value chains have been identified and mapped clearly, the firm must ask itself whether or not enough experience exists in each of

these aspects within its top management team. If this is not the case, the firm could search for new top managers with previous industry or job backgrounds that have enabled them to get sufficient experience in and knowledge of the specific aspects of the value chains in which knowledge is lacking. Thus, increasing this type of diversity would enable the firm's top management team to be better able at defining successful innovation strategies. The benefit of diversity in these indicators is likely directly linked to the complexity of the products a firm produces. For firms developing simpler products, this having a simpler product value chain, the benefit of having a high degree of diversity in industry background of top managers is likely to be lower.

A second generalization concerns the indicators of top management team tenure and firm tenure. As a general rule, firms should avoid large gaps within either of these indicators within their top management teams. Clear gaps in these indicators increase the chance of sub-group formation within the top management team which negatively influences the strategic decision making process. Having diversity within the top management team in these indicators however has been found to be beneficial for firms. A top management team with very high firm tenure and top management team tenure may have proven its success over time and possess a great deal of relevant knowledge, it does stimulate the occurrence of 'tunnel vision' as top managers are inclined to continue closely along innovation strategies which have resulted in previous success. In changing industries however, this can form a threat for the firm as it runs the risk of falling behind competitors as they may innovate more and faster. On the other hand, a top management team with very short firm tenure and top management team tenure may possess too little knowledge of the firm or the industries the firm is active in, and therefore be unable to define innovation strategies to lead the firm to success. A top management team with diversity in both these indicators combines the best of both worlds: having intimate knowledge of the firm and industries it is active in, yet offering fresh perspectives for the firm's future vision, policy on innovation and innovation strategy.

When designing a new top management team, firms in general are thus advised to take these recommendations in account. Although the desired degree of diversity may degree per industry and per firm, diversity as described above has been found to positively influence firms' capabilities of defining successful innovation strategies.

The results found during this research can not only be used make recommendations for other firms, but also for scientists studying innovation in firms. As this study has shown, a firm's capability of defining successful innovation strategies is very much dependent on its top management team and the diversity that exists within this team. Scientists interested in questions why particular firms have defined specific innovation strategies are therefore advised to take notion of the degree of diversity in these indicators that exists within the top management team of the firms studied. Another recommendations rests on the inclusion of the context of the specific firms. While previous studies using the upper echelon theory have suggested the possible importance of the context of the firm when researching effects of diversity, this study has indeed proven the importance of this context. This research has shown that, while diversity is important in general for the strategic decision making process of a top management team, the specific context of the firm is highly influential as to the degree of the benefit of diversity and the exact type of diversity that is desired. Researchers conducting similar research are thus advised to take the context of the specific firms into account during their studies in order to draw reliable and strong conclusions. The third and final contribution to scientific research lies in the relationship between the three mediators of this result. The findings

from this research have shown that indeed, these three mediators all influence each other a great deal. Scientists conducting further research using a similar approach can thus take into the account that these mediators should not be treated as separate from each other, but that they are highly dynamic and influential of each other.

# *11. Literature*

ABI Research (2006) Mobile Phone Innovation in Japan and South Korea, available at http://www.abiresearch.com/research/1003400-Mobile+Phone+Innovation+in+Japan+and+South+Korea, last visited: 21-02-2011

Altheide, D. (1996) Qualitative Media Analysis, *Sage Publications,* Newbury Park, United States

Arthur, J. (1994) Effects of human resource systems on manufacturing performance and turnover, *Academy of Management Journal,* Volume 37, Issue 3, pp. 670-687

Amason, A. (1996) Distinguishing the effects of functional and dysfunctional conflict on strategic decision making: Resolving a paradox for top management teams, *Academy of Management Journal*, Volume 39, pp. 123-148

Anderson, J. and Jonsson, M. (2006) Mobile Transitions, *Business Strategy Review,* Volume 17, Issue 1, pp. 20-25

Android Developers (2009) What is Android, available at http://developer.android.com/guide/basics/what-is-android.html, last visited: 08-05-2011

Apple (2007) Apple Reinvents the Phone with iPhone, available at http://www.apple.com/pr/library/2007/01/09iphone.html, last visited: 07-02-2011

Arora, A., Fosfuri, A., Gambardella, A. and Chesbrough, H. (2002) Markets for Technology: The Economics of Innovation and Corporate Strategy, *Journal of economic literature*, Volume 40, Issue 4, pp. 1275-1276

Bantel, K. and Jackson, S. (1989) Top management and innovations in banking: does the composition of the top team make a difference?, *Strategic Management Journal, V*olume 10, pp. 107–124

Bao, Y., Olson, B. and Paravitam, S. (2007) Strategic Decision Making: The Effects of Cognitive Diversity, Conflict, and Trust on Decision Outcomes, *Journal of management*, Volume 33, Issue 2, pp. 196-222

Barczak, G. (1995) New Product Strategy, Structure, Process, and Performance in the Telecommunications Industry, *Journal of Product Innovation Management,* Volume 12, Issue 3, pp. 224-234

Barnes, W., Gartland, M. and Stack, M. (2004) Old Habits Die Hard: Path Dependency and Behavioral Lock-In, *Journal of Economic Issues*, Volume 38

Baron, R. and Kenny, D. (1986) The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations, *Journal of Personality and Social Psychology,* Volume 51, Issue 6, pp. 1173-1182

BBC News (2006) Nokia's market share back at 35 percent, available at http://news.bbc.co.uk/2/hi/business/4758026.stm, last visited: 22-02-2011

Beattie, V. and Jones, M. (1992) The use and abuse of graphs in annual reports: a theoretical framework and an empirical study, *Accounting and Business Research*, Volume 22, Issue 88, pp. 291-303

Berelson, B. (1952) Content Analysis in Communication Research, *Free Press,* Glencoe, United States

Boeker, W. (1997) Strategic change: The influence of managerial characteristics and organizational growth, *Academy of Management Journal,* Volume 40, Issue 1, pp. 152-170

Boulding, W., Moore, M., Staelin, R., Corfman, K., Dickson, P., Fitzsimons, G., Gupta, S., Lehmann, D., Mitchell, D., Urbany, J. and Weitz, B. (1994) Understanding managers' strategic decision-making process, *Marketing letters*, Volume 5, Issue 4, pp. 413-426

Businessweek (2010) Motorola's Market Share Mess, available at http://www.businessweek.com/technology/content/jul2008/tc20080710_148095.htm?chan=search, last visited: 07-02-2011

Businessweek (2010) Nokia Misses Smartphone Boom as Customers Flock to IPhone 4, available at http://www.businessweek.com/news/2010-06-16/nokia-misses-smartphone-boom-as-customers-flock-to-iphone-4.html, last visited: 06-02-2011

Campos, J. (1999) An Exchange on Definitions of Innovation from the Innovative Management Network, available at http://www.innovation.cc/discussion-papers/definition.htm, last visited: 18-02-2011

Carlin, W., Schaffer, M. and Seabright, P. (2004) A Minimum of Rivalry: Evidence from Transition Economies on the Importance of Competition for Innovation and Growth, *Contributions to Economic Analysis & Policy*, Volume 3, Issue 1, Article 17

Carmeli, A., Gelbard, R. and Gefen, D. (2010) The importance of innovation leadership in cultivating strategic fit and enhancing firm performance, *Leadership Quarterly*, Volume 21, Issue 3, pp. 339-349

Carpenter, M. (2002) The implications of strategy and social context for the relationship between top management team heterogeneity and firm performance, Strategic Management Journal, Volume 23, Issue 3, pp. 275-284

Carpenter, M., Geletkanycz, M., and Sanders, W. (2004) Upper echelons revisited: Antecedents, elements, and consequences of top management team composition. *Journal of Management*, Volume 30, pp. 749-778

Cefis, E. and Marsili, O. (2005) A matter of life and death: innovation and firm survival, *Industrial and Corporate Change,* Volume 14, Issue 6, pp. 1167-1192

Cellular News (2009) Nokia Shuffles Management After Reporting Quarterly Loss, available at http://www.cellular-news.com/story/40096.php, last visited: 06-02-2011

Certo, S., Lester, R., Dalton, C. and Dalton, D. (2006) Top Management Teams, Strategy and Financial Performance: A Meta-Analytic Examination, *Journal of Management Studies*, Volume 43, Issue 4, pp. 813-839

Cha, B. (2010) Motorola to focus less on Motoblur, more on products, available at: http://www.cnet.com/8301-19736_1-20013063-251.html, last visited: 20-08-2011

Chen, M., Smith, K., and Grimm, C. (1992) Action characteristics as predictors of competitive responses, *Management Science*, Volume 38, pp. 439-455

Choon, A. (2003) Moving mountains at LG, available at: http://news.cnet.com/Moving-mountains-at-LG/2008-1041_3-5484289.html, last visited: 20-09-2011

CNET (2007) Nokia's profits surge, available at http://news.cnet.com/Nokias-profits-surge/2100-1039_3-6153246.html, last visited: 07-04-2011

CNET (2010) Too little, too late for Nokia?, available at http://www.cnet.com/8301-17918_1-20016545-85.html, last visited: 12-07-2011

Coad, A. and Rao, R. (2008) Innovation and firm growth in high-tech sectors: A quantile regression approach, *Research Policy,* Volume 37, Issue 4, pp. 633-648

Computerworld (2000) Party Politics of Projects, available at http://www.computerworld.com.au/article/82514/party_politics_projects/, last visited: 17-03-2011

Coombs, R. and Hull, R. (1997) 'Knowledge management practices' and path-dependency in innovation, *CRIC Discussion Paper,* Volume 2

Cooper, R. (1984) The Strategy-Performance Link in Product Innovation, *R&D Management*, Volume 14, Issue 4, pp. 247-259

Cooper, R. (1990) Stage-Gate Systems: A New Tool for Managing New Products, *Business Horizons,* May-June 1990, pp. 44-54

Cooper, R. and Kleinschmidt, E. (1995) Benchmarking for firm's critical success factors in new product development, *Journal of Product Innovation Management*, Volume 12, pp. 374-391

Dahlin, K., Weingart, L., and Hinds, P. (2005) Team diversity and information use, *Academy of Management Journal,* Volume 48, Issue 6, pp. 1107–1123

Daniel, C. (2003) Motorola to buy software start-up, *Financial Times*, September 16, 2002

De Drue, C. (2006) When Too Little or Too Much Hurts: Evidence for a Curvilinear Relationship Between Task Conflict and Innovation in Teams, *Journal of management*, Volume 32, Issue 1, pp. 83-107

Dittrich, K. and Duysters, G. (2007) Networking as a Means to Strategy Change: The Case of Open Innovation in Mobile Telephony, *Journal of Product Innovation Management*, Volume 26, Issue 6, pp. 510-521

E-Articles (2006) Which are the basic System Components of a mobile phone, available at http://e-articles.info/e/a/title/Which-are-the-basic-System-Components-of-a-mobile-phone/, last visited: 20-02-2011

Edquist, C. (1997) Systems of innovation: technologies, institutions, and organizations, *Routledge,* Abingdon, England

Electronic Design (2004) Mobile Phones Promise A Slew Of Innovations, available at http://electronicdesign.com/article/communications/mobile-phones-promise-a-slew-of-innovations7606.aspx, last visited: 14-02-2011

Elu, S. and Kyngäs, H. (2008) The qualitative content analysis process, *Journal of Advanced Nursing,* Volume 62, Issue 1, pp. 107-115

Ensley, M., Pearson, A. and Amason, A. (2002) Understanding the dynamics of new venture top management teams Cohesion, conflict, and new venture performance, *Journal of Business Venturing*, Volume 17, pp. 365-386

Epcos (2009) Leadership through technology competence, available at http://www.epcos.com/web/generator/Web/Sections/Components/Page,locale=en,r=263288,a=1005202.html, last visited: 21-02-2011

Experiment Resources (2008) Types of Research Designs, available at http://www.experiment-resources.com/research-designs.html, last visited: 09-05-2011

Feurer, R. and Chaharbaghi, K. (1995) Performance measurement in strategic change, *Benchmarking: An International Journal*, Volume 2, Issue 2, pp. 64-83

Fifield, A. (2004) Adrenalin for LG Electronics' brand, *Financial Times,* December 15, 2004

Fifield, A. (2007) Nam Yong: Ambition to become a cradle of talent, *Financial Times*, October 23, 2007

Fleming, D., Chow, C. and Chen, G. (2009) Strategy, performance-measurement systems, and performance: A study of Chinese firms, *International journal of accounting*, Volume 44, Issue 3, pp. 256-278

Forbes (2011) iPhone Eats Market Share, Pushes Apple Stock Above $470, available at: http://blogs.forbes.com/greatspeculations/2011/01/10/iphone-eats-market-share-pushes-apple-stock-above-470/, last visited: 09-02-2011

Gartner (2005) Gartner Says Strong Fourth Quarter Sales Led Worldwide Mobile Phone Sales to 30 Percent Growth in 2004, available at http://www.gartner.com/press_releases/asset_121402_11.html, last visited: 03-05-2011

Gartner (2009) Gartner Says Worldwide Mobile Phone Sales Grew 6 Per Cent in 2008, But Sales Declined 5 Per Cent in the Fourth Quarter, available at http://www.gartner.com/it/page.jsp?id=904729, last visited: 07-05-2011

Gartner (2010) Gartner Says Worldwide Mobile Phone Sales Grew 35 Percent in Third Quarter 2010; Smartphone Sales Increased 96 Percent, available at http://www.gartner.com/it/page.jsp?id=1466313, last visited: 02-04-2011

Gartner (2010) Gartner Says Worldwide Mobile Phone Sales to End Users Grew 8 Per Cent in Fourth Quarter 2009; Market Remained Flat in 2009, available at http://www.gartner.com/it/page.jsp?id=1306513, last visited: 06-02-2011

Ginsberg, A. and Venkatraman, N. (1985) Contingency perspectives of organizational strategy: a critical review of the empirical research, *Academy of Management Review,* Volume 10, Issue 3, pp. 421-434

Glassdoor (2009) Nokia – Top management is not up to the challenge, available at http://www.glassdoor.com/Reviews/Employee-Review-Nokia-RVW269339.htm, last visited: 06-02-2011

Golden, B. (1992) The past is the past – or is it? The use of retrospective accounts as indicators of past strategy, *Academy of Management Journal,* Volume 35, Issue 4, pp. 848-860

Gowers, A. (2005) When the cutting edge frightens the customers, *Financial Times*, October 13, 2005

Greve, H. (2003) Organizational learning from performance feedback: A behavioral perspective on innovation and change, *University Press*, Cambridge, United Kingdom

Grienitz, V. and Ley, S. (2007) Scenarios for the strategic planning of technologies, Journal of *Technology Management & Innovation,* Volume 2, Issue 3, pp. 21-37

GSM Arena (2010) Motorola ends fiscal Q2 with healthy profit, available at http://www.gsmarena.com/motorola_ends_fiscal_q2_with_healthy_profit-news-1846.php, last visited: 07-02-2011

GSM Dome (2010) Nokia Changes Management Team Again, available at http://www.gsmdome.com/nokia/nokia-changes-management-team-again_15533, last visited: 06-02-2011

Hambrick, D. (1987) The Top Management Team: Key to Strategic Success, *California Management Review,* Volume 30, Issue 1, pp. 88-108

Hambrick, D. (2007) Upper echelons theory: an update, *Academy of Management Review*, Volume 32, Issue 2, pp. 334-343

Hambrick, D., and Mason, P (1984) Upper echelons: The organization as a reflection of its top managers, *Academy of Management Review*, Volume 9, pp. 193-206

Harborne, P. and Johne, A. (2003) Creating a project climate for successful product innovation, *European Journal of Innovation Management*, Volume 6, Issue 2, pp. 118-132

Helablian, J. and Finkelstein, S. (1993) Top management team size, CEO dominance and firm performance: the moderating roles of environmental turbulence and discretion, *Academy of Management Journal,* Volume 36, Issue 4, pp. 844-863

Hitt, M., Hoskisson, R., Johnson, R. and Moesel, D. (1996) The market for corporate control and firm innovation, *Academy of Management Journal,* Volume 39, Issue 5, pp. 1084-1119

Holsti, O. (1969) Content Analysis for the Social Sciences and Humanities, *Addison-Wesley,* Reading, United States

Horne, D. and Martin, C. (1993) Services Innovation: Successful versus Unsuccessful Firms, *International Journal of Service Industry Management*, Volume 4, Issue 1, pp. 49-65

Hshieh, H. and Shannon, S. (2005) Thee Approaches to Qualitative Content Analysis, *Qualitative Health Research,* Volume 15, Issue 9, pp. 1277-1288

Huergo, E. and Jaumandreu, J. (2004a) Firms' age, process innovation and productivity growth, *International Journal of Industrial Organization,* Volume 22, Issue 4, pp. 541-559

Huergo, E. and Jaumandreu, J. (2004b) How does probability of innovation change with firm age?, *Small Business Economics,* Volume 22, Issue 3-4, pp. 193-207

IDC (2011) Mobile Phone Market Grows 17.9% in Fourth Quarter, According to IDC, available at http://www.idc.com/about/viewpressrelease.jsp?containerId=prUS22679411&sectionId=null&elementId=null&pageType=SYNOPSIS, last visited: 02-04-2011

Infopreneur Media (2010) The truth about lying on your resume, available at http://www.vitrolenta.com/jobs-careers/the-truth-about-lying-on-your-resume.html, last visited: 24-05-2011

Information Week (2007) Take 5: The Evolution Of The Mobile Phone User Experience, available at: http://www.informationweek.com/blog/main/archives/2007/04/take_5_the_evol.html, last visited: 16-02-2011

ITU (2009) Key global telecom indicators for the world

Jehn, K., Greer, L., Levine, S. and Szulanski, G. (2008) The Effects of Conflict Types, Dimensions, and Emergent States on Group Outcomes, *Group decision and negotiation*, Volume 17, Issue 6, pp. 465-495

Joshi, A. and Roh, H. (2009) The role of context in work team diversity research: a meta-analytic review, *Academy of Management Journal* , Volume 52, Issue 3

Jung-a, S. (2008) LG signals faster push into emerging markets, *Financial Times,* August 21, 2008

Kaufman, R. and Herman, J. (1991) Strategic Planning for a Better Society, *Educational Leadership,* Volume 48, Issue 7, pp. 4-8

Kickul, J. and Gundry, L. (2001) Breaking through boundaries for organizational innovation: New managerial roles and practices in e-commerce firms, *Journal of Management*, Volume 27, pp. 347-361

Kilduff, M., Angelmar, R., and Mehra, A. (2000) Top management-team diversity and firm performance: Examining the role of cognitions, *Organization Science*, Volume 11, pp. 21-34

Konnola, T., Brummer, V and Salo, A. (2007) Diversity in foresight: Insights from the fostering of innovation ideas, *Technological forecasting and social change*, Volume 74, Issue 5, pp. 608-626

Kor, Y. (2006) Direct and interaction effects of top management team and board compositions on R&D investment strategy, *Strategic Management Journal,* Volume 27, pp. 1081-1099

Krippendorff, K. (2004) Content analysis: an introductions to its methodology, *Sage Publications,* Thousand Oaks, United States

Kuhn, T. and Poole, M. (2000) Do Conflict Management Styles Affect Group Decision Making?, *Human communication research*, Volume 26, Issue 4, pp. p558-591

Landler, M. (2007) Nokia says it was far ahead of Google on new cellphone technology, *The New York Times*, November 10, 2007

Leskovar-Spacapan, G. and Bastic, M. (2007) Differences in organizations' innovation capability in transition economy: Internal aspect of the organizations' strategic orientation, *Technovation*, Volume 27, Issue 9, pp. 533-546

LG (2002) Annual report

LG (2003) Annual report

LG (2007) Annual report

LG (2008) Annual report

LG (2009) LG Electronics 50-year History, available at http://www.lg.com/global/about-lg/corporate-information/at-a-glance/history.jsp, last visited: 03-04-2011

LG (2011) LG Products, available at http://www.lg.com/global/products/index.jsp, last visited: 16-04-2011

Li, F. (2008) Annual report readability, current earnings, and earnings persistence, *Journal of Accounting and Economics,* Volume 45, Issues 2-3, pp. 221-247

Li, J., and Hambrick, D., (2005) Factional groups: a new vantage on demographic faultlines, conflict, and disintegration in work teams, *Academy of Management Journal*, Volume 48, Issue 5, pp. 794-813

Li, J. and Li, H. (2009) Top management team conflict and entrepreneurial strategy making in China, *Asia Pacific journal of management*, Volume 26, Issue 2, pp. 263-283

Lohr, S. (2002) Nokia to Join With I.B.M. in 2 Ventures on Software, *The New York Times,* July 9, 2002

Lohr, S. (2005) FUNCTION; How Much Is Too Much?, The New York Times, May 4, 2005

Lu, Y. and Yu, F. (2010) The Evaluation of the Innovation Capability of China's High-Tech Industries, *International Business Research*, Volume 3, Issue 2, pp. 87-91

Macdonald, A. (2010) Embracing technophobes and technophiles: customer-centred product innovation in Japanese mobile phones 2003-2007, *Journal of Engineering Design*, Volume 21, Issue 2/3, pp. 147-165

Maney, F. (2004) CEO Ollila says Nokia's 'sisu' will see it past tough times, *USA Today*, July 20, 2004

Maney, K. (2004) New CEO hopes to 'turn up' Motorola as he cuts through corporate crud, available at: http://www.usatoday.com/money/industries/technology/maney/2004-02-18-motorola_x.htm, last visited: 20-07-2011

Market Watch (2008) Motorola profit sinks on mobile woes, available at http://www.marketwatch.com/story/motorola-profit-slides-on-mobile-woes-shares-hit-5-year-low , last visited: 07-02-2011

Mayring (2000) Qualitative Content Analysis, *Forum: Qualitative Social Research,* Volume 1, Issue 2, Article 20

McCartney, N. (2003) Geneva Telecoms Special: Squaring up to usability at Nokia, *Financial Times,* October 13, 2003

McGuigan, J. (2005) Towards a Sociology of the Mobile Phone, *Human Technology: An Interdisciplinary Journal on Humans in ICT Environments,* Volume 1, Issue 1, pp. 45-57

MENAFN (2011) Decrease in Nokia's global cell-phone market share, available at http://www.menafn.com/qn_news_story_s.asp?storyid=1093390605, last visited: 08-02-2011

Milliken, F., and Martins, L. (1996) Searching for common threads: Understanding the multiple effects of diversity in organizational groups, *Academy of Management Review*, Volume 21, pp. 402–433

Motorola (2002) Annual report

Motorola (2005) Annual report

Motorola (2006) Motorola Ships 50 Millionth MOTORAZR, available at http://mediacenter.motorola.com/Press-Releases/Motorola-Ships-50-Millionth-MOTORAZR-1589.aspx, last visited: 22-02-2011

Motorola (2009) Annual report

Naranjo-Gil, D. and Hartmann, F. (2007) Management accounting systems, top management team heterogeneity and strategic change, *Accounting, Organizations and Society,* Volume 32, Issues 7-8, pp. 735-756

Narayanan, V., Zane, L. and Kemmerer, B. (2011) The Cognitive Perspective in Strategy: An Integrative Review, *Journal of Management*, Volume 37, Issue 1, pp. 305-351

NASDAQ (2011) Apple's Sensitivity to iPhone Market Share, available at http://community.nasdaq.com/News/2011-01/apples-sensitivity-to-iphone-market-share.aspx?storyid=51393, last visited: 09-02-2011

Neely, A., Fillippini, R., Forza, C., Vinelli, A. and Hii, J. (2001) A framework for analyzing business performance, firm innovation and related contextual factors: perceptions of managers and policy makers in two European regions, *Integrating Manufacturing Systems,* Volume 12, Issue 2, pp. 114-124

Nokia (2002) Annual report

Nokia (2004) Annual report

Nokia (2005) Annual report

Nokia (2008) Annual report

Nooteboom, B. (2000) Learning and Innovation in Organizations and Economies. *Oxford University Press*, Oxford, England

Nooteboom, B., Haverbeke, W., Duysters, G., Gilsing, V. and van den Oord, A. (2007) Optimal cognitive distance and absorptive capacity, *Research Policy*, Volume 36, pp. 1016-1034

OECD (2007) Innovation: the OECD Definition, available at http://www.oecd.org/document/10/0,3746,en_2649_33723_40898954_1_1_1_1,00&&en-USS_01DBC.html, last visited: 17-02-2011

Olsen, B., Parayitam, S. and Bao, Y. (2007) Strategic Decision Making: The Effects of Cognitive Diversity, Conflict, and Trust on Decision Outcomes, *Journal of Management*, Volume 33, Issue 2, pp. 196-222

Ortiz, D., Myers, D., Walls, E. and Diaz, M-E. (2005) Where do we stand with newspaper data?, *Mobilization: An International Quarterly,* Volume 10, Issue 3, pp. 397-419

Pappas, C. (1984) Strategic Management of Technology, *Journal of Product Innovation Management*, Volume 1, pp. 30-35

PCWorld (2008) Ex-AT&T CEO to Head Motorola's Board, available at http://www.pcworld.com/businesscenter/article/144315/exatandt_ceo_to_head_motorolas_board.html, last visited: 09-02-2011

PCWorld (2009) The Mobile Phone: A History in Pictures, available at http://www.pcworld.com/article/180683/first_smartphone_nokia_9000_communicator_1996.html, last visited: 06-02-2011

Pelled, L., Eisenhardt, K., & Xin, K. (1999). Exploring the black box: An analysis of work group diversity, conflict, and performance, *Administrative Science Quarterly*, Volume 44, pp. 1-28

Penrose, E. (2008) Strategy/Organization and the Metamorphosis of the Large Firm, *Organization Studies,* Volume 9, Issue 8-9, pp. 1117-1124

Pertierra, R. (2005) Mobile Phones, Identity and Discursive Intimacy, *Human Technology: An Interdisciplinary Journal on Humans in ICT Environments*, Volume 1, Issue 1, pp. 23-44

Pingdom (2009) The future of mobile phones is software not hardware, available at http://royal.pingdom.com/2009/08/05/the-future-of-mobile-phones-is-software-not-hardware/, last visited: 16-02-2011

Pitcher, P. and Smith, A. (2001) Top Management Team Heterogeneity: Personality, Power, and Proxies, *Organization Science*, Volume 12, Issue 1, pp. 1-18

Pocket Now (2010) A Look at the First HTC Phone Ever Released, available at http://pocketnow.com/thought/a-look-at-the-first-htc-phone-ever-released, last visited: 21-02-2011

Porter, M. (1985) Competitive Strategy, *Free Press*, New York, United States

PR Newswire (2010) Mobile Phone Components Market is Booming, available at http://www.prnewswire.com/news-releases/himfrcom-reports-mobile-phone-components-market-is-booming-61937987.html, last visited: 20-02-2011

Recombu (2010) LG Mobile Phone Reviews, available at http://recombu.com/reviews/lg/, last visited: 30-03-2011

Reis, C., Castillo, M., and Dobon, S. (2007) Diversity and business performance: 50 years of research. *Service Business*, Volume 1, pp. 257-274

Reller, A., Bublies, T., Staudinger, T., Oswald, I., Meiβner, S. and Allen, M. (2009) The Mobile Phone: Powerful Communicator and Potential Metal Dissipator, *Gaia,* Volume 18, Issue 2, pp. 127-135

Ritchie, W., Anthony, W. and Rubens, A. (2004) Individual Executive Characteristics: Explaining the Divergence Between Perceptual and Financial Measures in Nonprofit Organizations, *Journal of business ethics*, Volume 53, Issue 3, pp. 267-281

Roychowdhury, I. (2007) LG to focus on high-end products, *The Financial Express*, December 11, 2007

Rustichini, A., Burks, S., Carpenter, J. and Goette, L. (2009) Cognitive skills affect economic preferences, strategic behavior, and job attachment, *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, Volume 106, Issue 19, pp. 7745-7750

Shevlin, M., McAdam, R., Moffett, S. and Hazlett, S. (2010) Developing a model of innovation implementation for UK SMEs: A path analysis and explanatory case analysis, *International small business journal*, Volume 28, Issue 3, pp. 195-214

Shih, C. and Lin, H. (2008) How Executive SHRM System Links to Firm Performance: The Perspectives of Upper Echelon and Competitive Dynamics, *Journal of Management,* Volume 34, Issue 5, pp. 853-881

Simons, T., Pelled, L., and Smith, K., (1999) Making use of difference: diversity, debate, and decision comprehensiveness in top management teams, *Academy of Management Journal*, Volume 42, Issue 6, pp. 662–673

Slappendel, C. (1996) Perspectives on Innovation in Organizations, *Organization Studies,* Volume 17, Issue 1, pp. 107-129

Slater, S. and Mohr, J. (2006) Successful Development and Commercialization of Technological Innovation: Insights Based on Strategy Type, *Journal of Product Innovation Management*, Volume 23, Issue 1, pp. 26-33

Smith, T. (2007) 15 years ago: the first mass-produced GSM phone, *Register Hardware*

Spannagel, C., Gläser-Zikuda, M. and Schroeder, U. (2005) Application of Qualitative Content Analysis in User-Program Interaction Research, *Forum: Qualitative Social Research,* Volume 6, Issue 2, Article 29

Song, J. (1982) Diversification Strategies and the Experience of Top Executives of Large Firms, *Strategic management journal,* Volume 3, Issue 4, pp. 377-380

Steinbock, D. (2005) Design and Mobile Innovation, *Design Management Review,* Volume 16, Issue 4, pp. 55-62

Stemler, S. (2001) An overview of content analysis, *Practical Assessment, Research & Evaluation,* Volume 7, Issue 17, available at http://pareonline.net/getvn.asp?v=7&n=17, last visited: 30-05-2011

Swank, E. (2000) In newspapers we trust?, *Research in Social Movements,* Issue 22, pp. 27-52

Tacheva, S. (2007) Top Management Team Diversity: A Multilevel Exploration of Antecedents and Consequences, *Dissertation to obtain the title of Doctor of Business Administration,* University of St. Gallen, Switzerland

Talke, K., Salomo, S. And Rost, K. (2010) How top management team diversity affects innovativeness and performance via the strategic choice to focus on innovation fields, *Research Policy*, Volume 39, pp. 907-918

Tan, K. (2005) Life Cycle Assessment of a Mobile Phone, available at http://eprints.usq.edu.au/499/1/KevinChinNingTAN-2005.pdf, last visited: 06-05-2011

Tan, A. (2006) At Motorola, giving IT a reality check, available at: http://news.cnet.com/At-Motorola,-giving-IT-a-reality-check---page-3/2008-1036_3-6130759-3.html, last visited: 23-09-2011

Tatge, M (2003) What Took Motorola So Long?, available at: http://www.forbes.com/2003/09/19/cz_mt_0919galvin.html, last visited: 20-07-2011

Taylor, P. (2006) Motorola launches developer forum on internet, *Financial Times*, May 8, 2006

Taylor, P. (2007) Motorola puts its faith in function, not form, *Financial Times*, May 17, 2007

Tech Crunch (2010) Why Mobile Innovation Is Blowing Away PCs, available at http://techcrunch.com/2010/06/20/why-mobile-innovation-is-blowing-away-pcs/, last visited: 16-02-2011

Techno Buffalo (2011) Sense, MotoBlur & TouchWiz: Android Skins Compared, available at http://www.technobuffalo.com/companies/google/android/sense-motoblur-touchwiz-android-skins-compared/, last visited: 08-05-2011

Tesch, R. (1990) Qualitative research: Analysis types and software tools, *Falmer Press,* New York, United States

The Boston Globe (2007) Introducing the Google Phone, available at http://www.boston.com/business/technology/articles/2007/09/02/introducing_the_google_phone/, last visited: 08-05-2011

The Cellular Guru (2010) Nokia maintains handset market share lead, HTC cracks top ten, available at http://thecellularguru.com/2010/08/14/nokia-maintains-handset-market-share-leader-htc-cracks-top-ten/, last visited: 22-02-2011

Thornhill, S. and White, R. (2007) Strategic purity: A multi-industry evaluation of pure vs. hybrid business strategies, *Strategic Management Journal,* Volume 28, Issue 5, pp. 553-561

Tidd, J., Bessant, J. and Pavitt, K. (2005) Managing Innovation, *John Wiley & Sons*, West Sussex, England

Timmons, H. (2005) Nokia Names an Insider to Succeed Chief, *The New York Times*, August 2, 2005

Top News (2009) Nokia and Qualcomm to join hands for new 3G phones, available at http://topnews.us/content/23678-nokia-and-qualcomm-join-hands-new-3g-phones, last visited: 16-06-2011

Trusted Reviews (2008) Motorola Phones Sales Crash 38 Per Cent, available at http://www.trustedreviews.com/mobile-phones/news/2008/01/24/Motorola-Phones-Sales-Crash-38-Per-Cent/p1, last visited: 07-02-2011

Van de Ven, A. and Huber, G. (1990) Longitudinal field research methods for studying processes of organizational change, *Organization Science,* Volume 1, Issue 3, pp. 213-219

Van Knippenberg, D., De Dreu, K., and Homan, A. (2004) Work group diversity and group performance: An integrative model and research agenda, *Journal of Applied Psychology*, Volume 89, pp. 1008-1022

Vaona, A. and Pianta, M. (2006) Firm Size and Innovation in European Manufacturing, *Small Business Economics,* Volume 30, Issue 3, pp. 283-299

Vedder, A. and Wachbroit, R. (2003) Reliability of information on the internet: some distinctions, *Ethics and Information Technology,* Volume 5, Issue 4, pp. 211-215

Wahl, A. (2006) Beyond the RAZR's edge, *Canadian Business*, Volume 79, Issue 22, p. 15

Weick, K., (1995) Sensemaking in Organizations, *Sage*, Thousand Oaks, California, United States

Williams, K. and O' Reilly, C. (1998) Demography and diversity in organizations: a review of 40 years research, *Research in Organizational Behavior*, Volume 20, pp. 77-140

Wolcott, H (1992) Posturing in qualitative inquiry, in: LeCompte, M., Millroy, W. and Preissle, J. (Eds.), The handbook of qualitative research in education, *Academic Press*, New York, United States

Wong, S. (2011) The Mediating Effects of Customer and Competitor Orientations on New Product Success, *International Journal of Business and Management*, Volume 6, Issue 8, pp. 34-43

Wright, M. and Beaumont, P. (2001) Managing Competitive Crisis: Strategic Choice and the Reform of Work Rules, *Industrial and labor relations review*, Volume 54, Issue 4, pp. 899-900

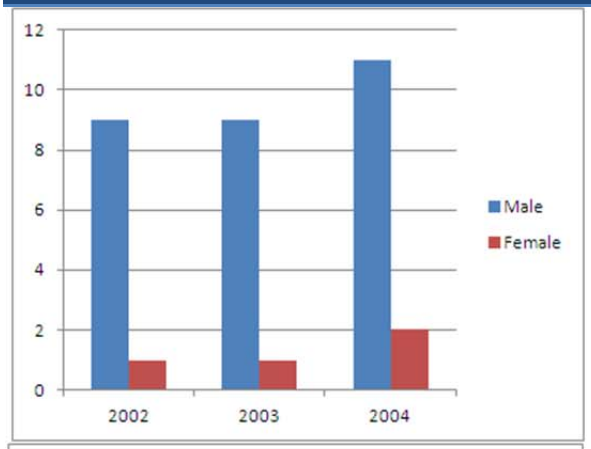
Yin, R. (2009) Case Study Research – Design and Methods, *Sage Publications*, London, England

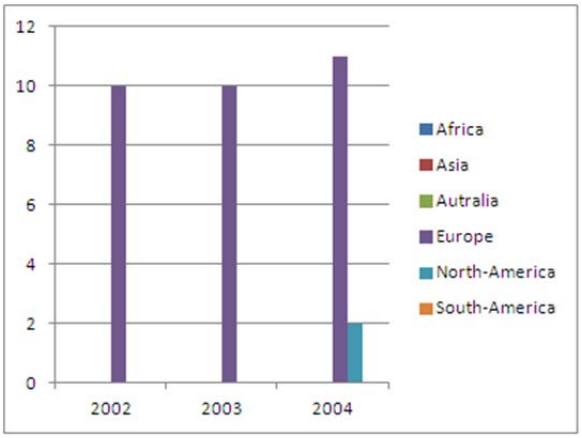
# *Appendix 1: The operationalization table*

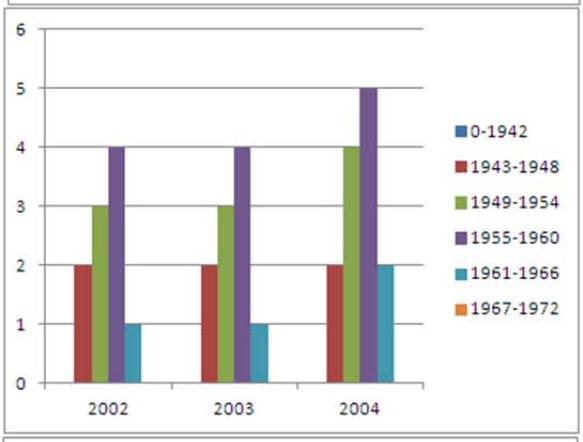
| Concept | Dimensions | Indicators | Measurement |
|---|---|---|---|
| Top management team diversity | 1. Relations-oriented<br><br>2. Task-oriented | 1. Age, Gender, Ethnicity<br><br>2. Top management team tenure, Industry background, Job background, Firm tenure | 1. Ratio, Nominal (M or F), Nominal, Dimension: 3-point Likert scale<br>2Ratio, Nominal, Nominal, Ratio, Dimension: 3-point Likert scale |
| Task conflict | | Overlap in job emphasis of top management team members | 3-point Likert scale |
| Future vision | 1. Timespan<br><br>2. Nature of the vision | 1. Number of years<br><br>2. Sub-categories to which the goals in the vision belong | 1. Nominal (1-2 years, 3-5 years, 6-10 years, 11+ years)<br>2. Nominal (new markets, changes in existing markets, technology, software) |
| Policy on innovation | 1. Drive for cooperation with other organizations<br><br>2. Focus on internal R&D<br><br>3. Role of innovation for the firm | 1. Drive to cooperate with others for innovation purposes<br><br>2. Percentage of employees involved in R&D, Percentage of earnings spent on R&D<br>3. Conservative versus cutting edge | 1. 3-point Likert scale<br><br>2. Percentage,<br><br>Percentage<br><br>3. Nominal (CO or CE) |
| Innovation strategy | 1. Focus of the innovation strategy<br><br>2. Quality of the innovation strategy | 1. Focus on innovation of relevant product characteristics<br><br>2. Quality of the innovation strategy based on inclusion of all relevant product characteristics | 1. Nominal (new product lines, Improvements in hardware, improvements in software)<br>2. 3-point Likert scale |

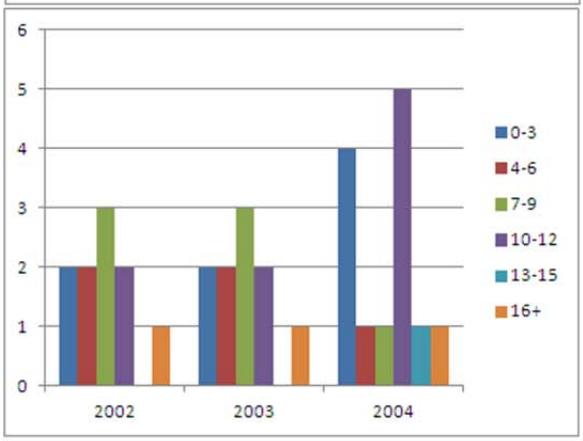
**Table 3: The operationalization table**

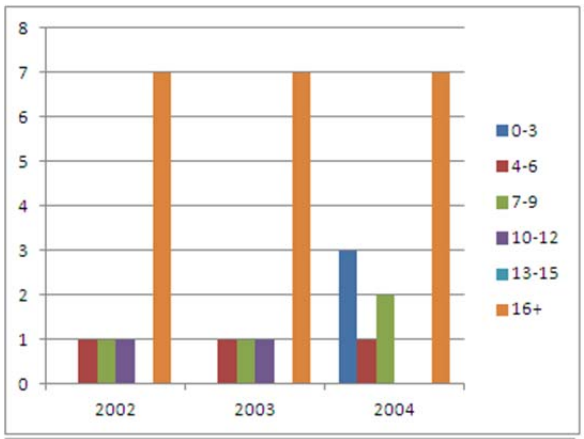
# Appendix 2: TMT members characteristics of Nokia

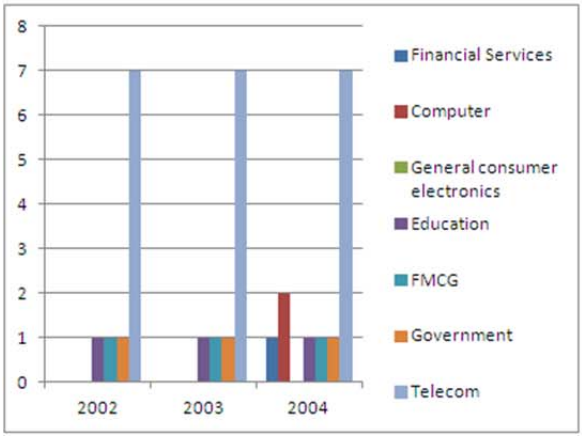


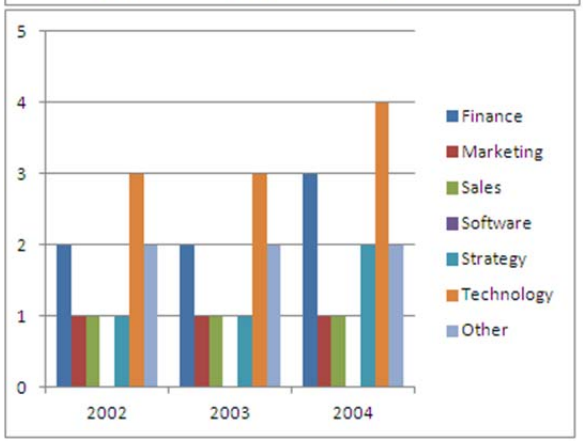



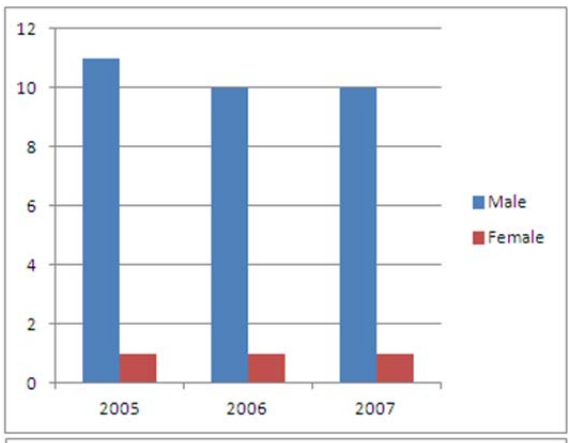

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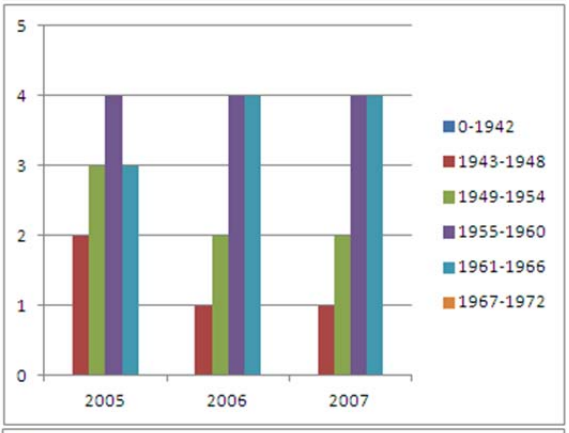
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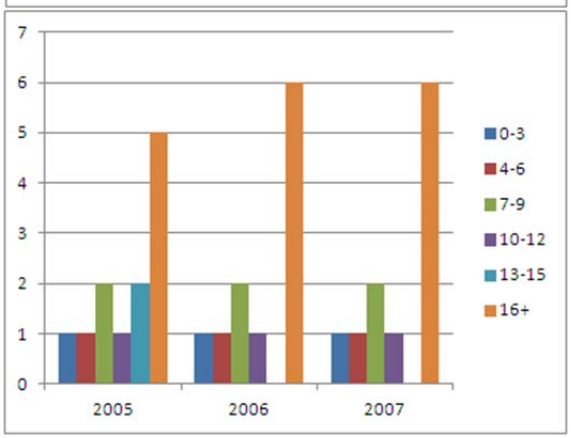
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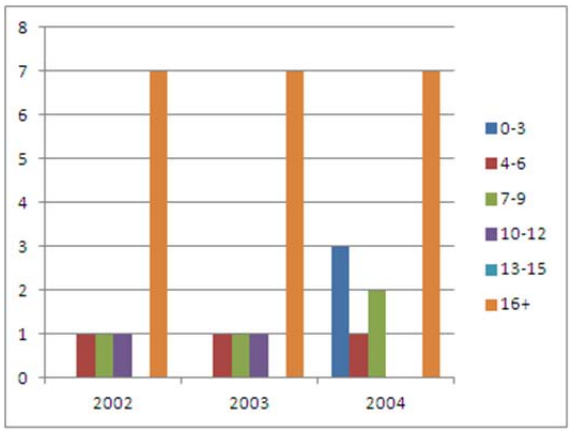
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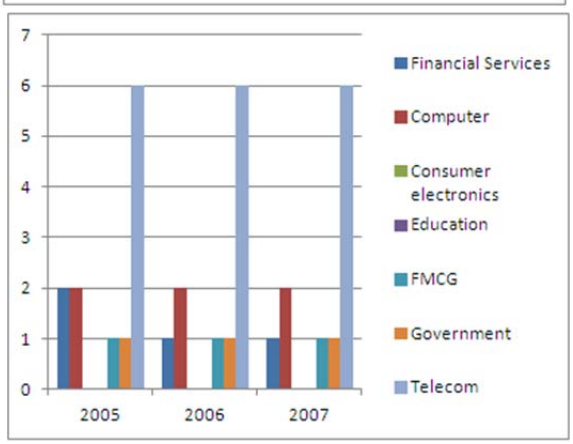
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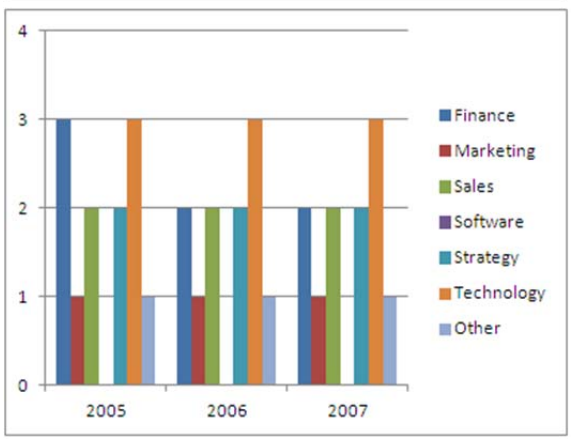
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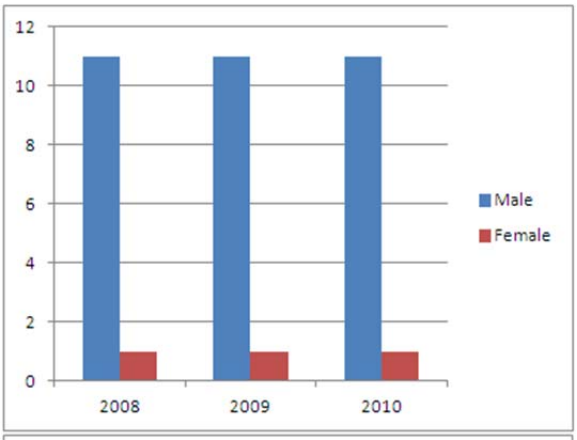
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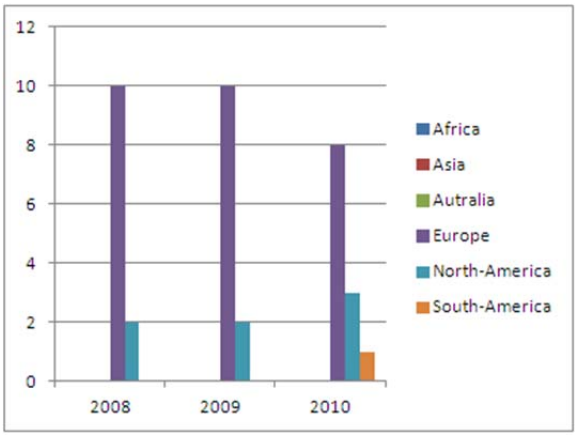
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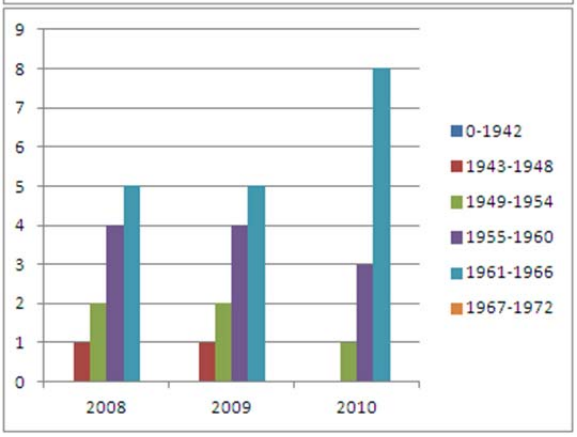
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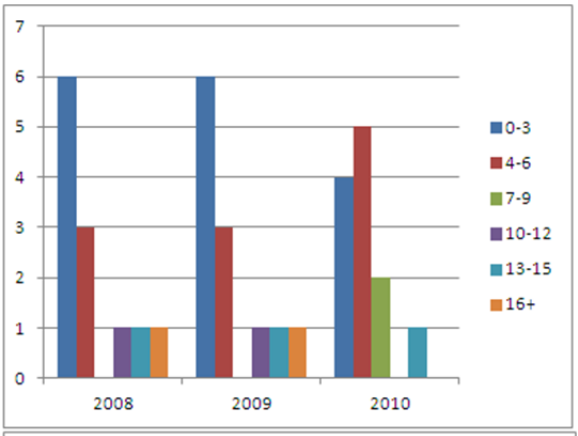
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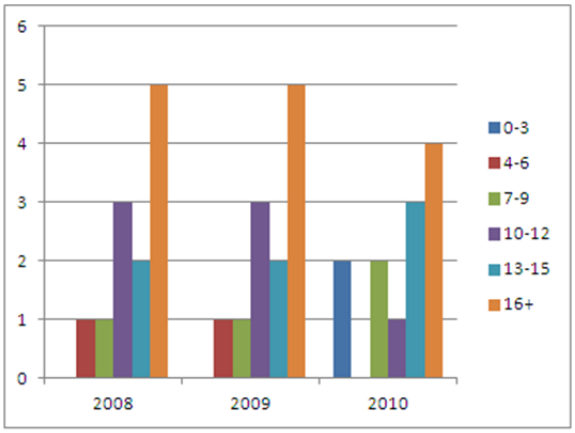
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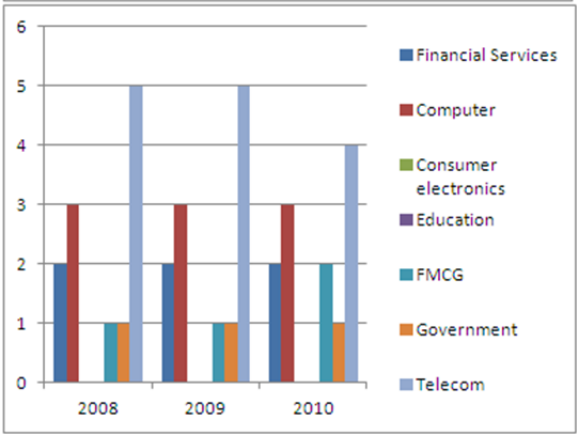
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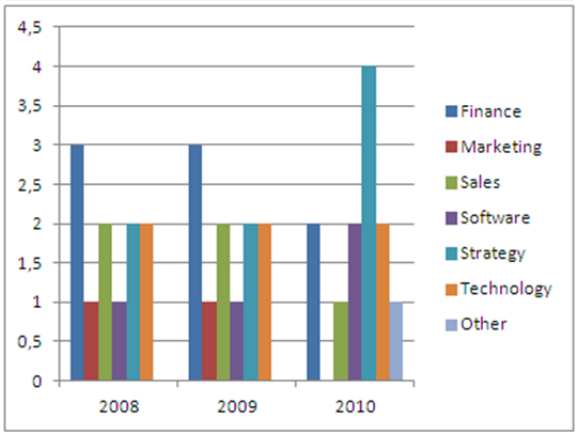
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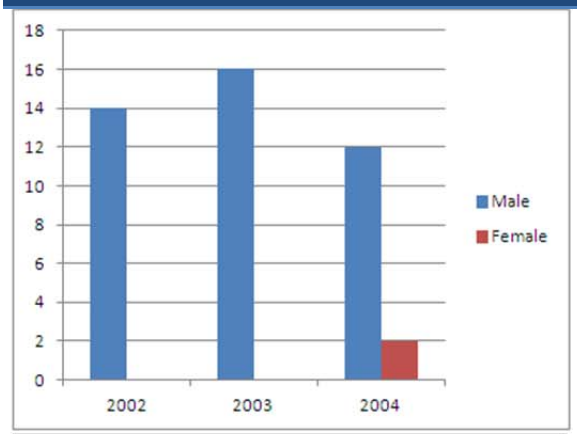
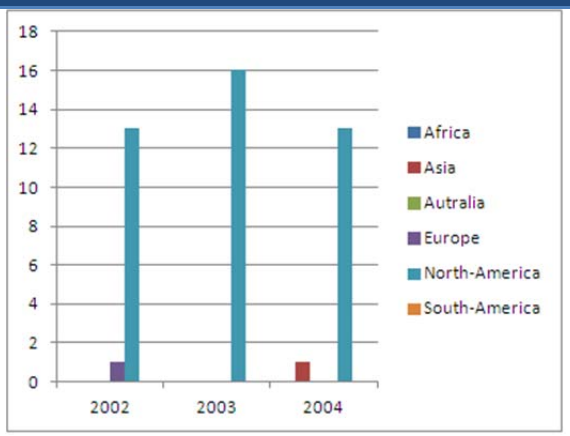
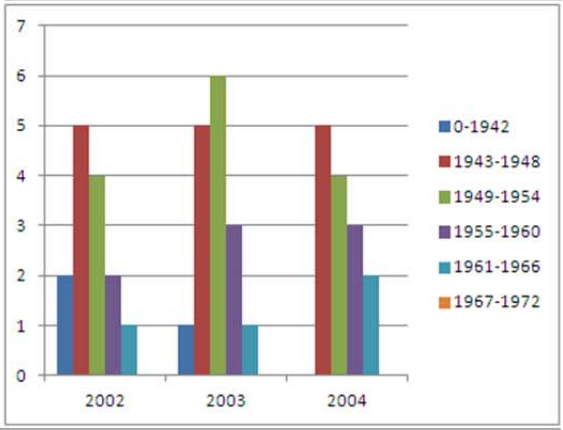
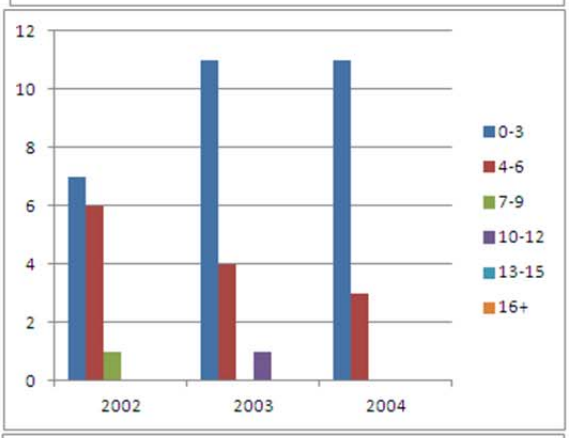
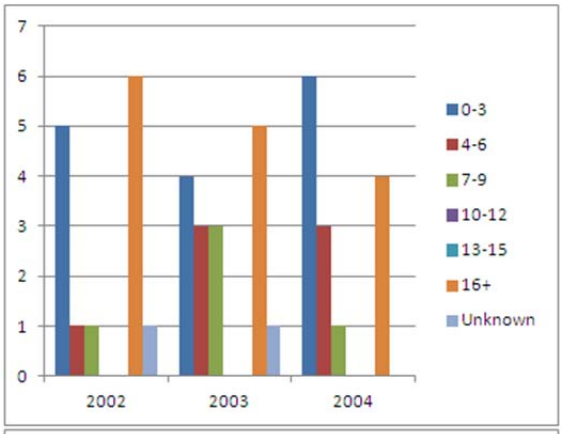
# Appendix 3: TMT members characteristics of Motorola

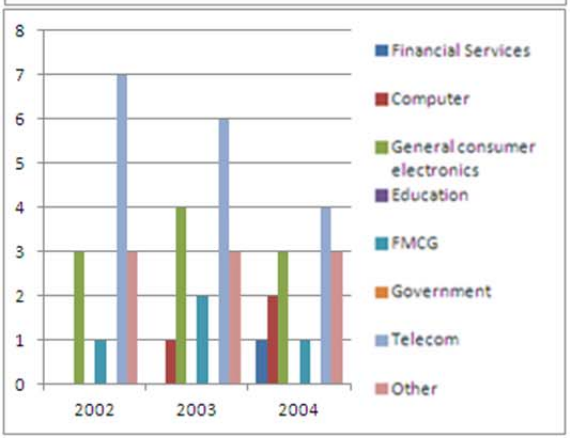


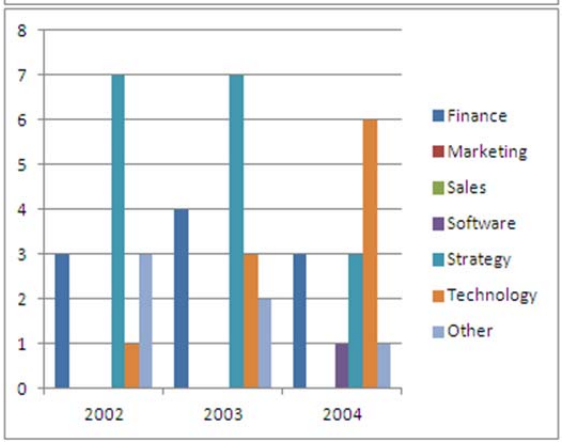



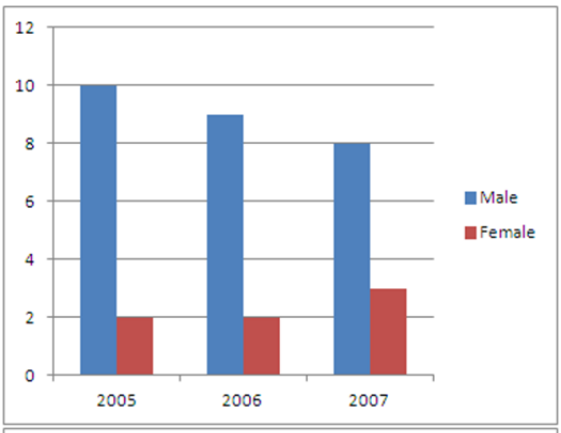

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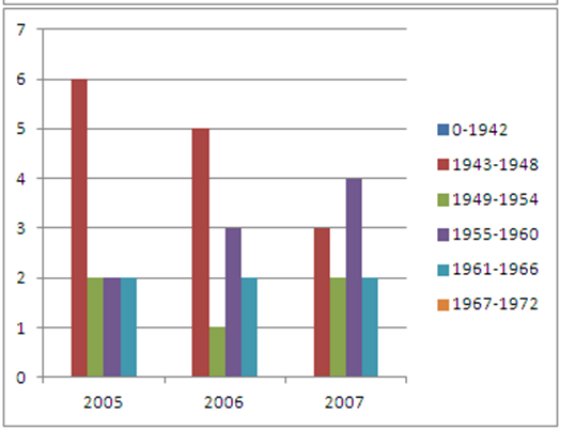
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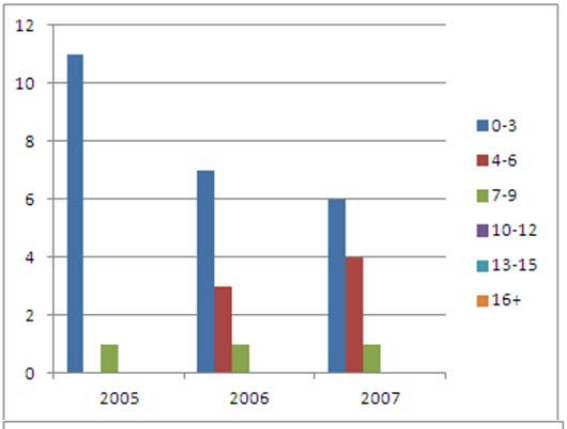
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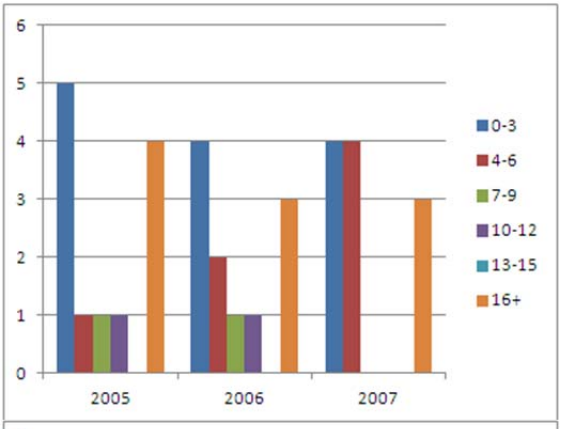
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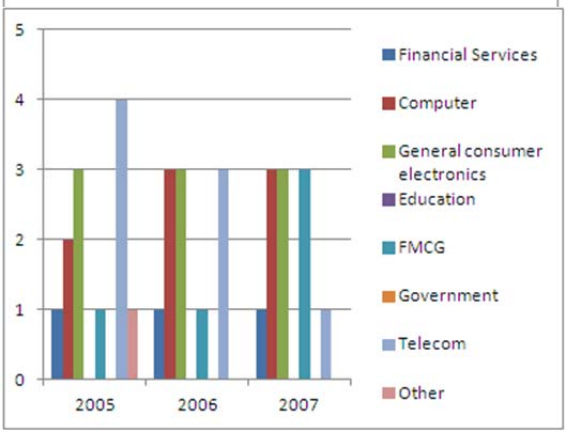
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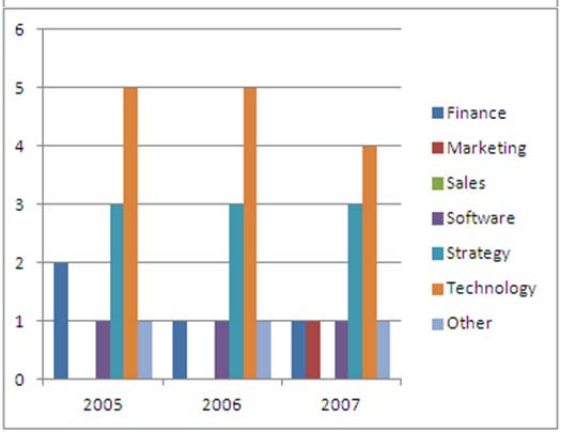
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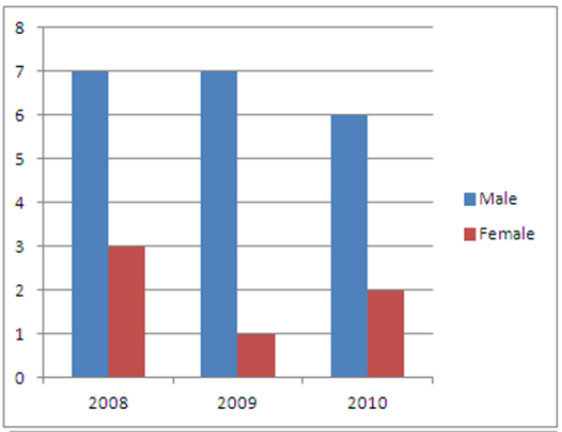
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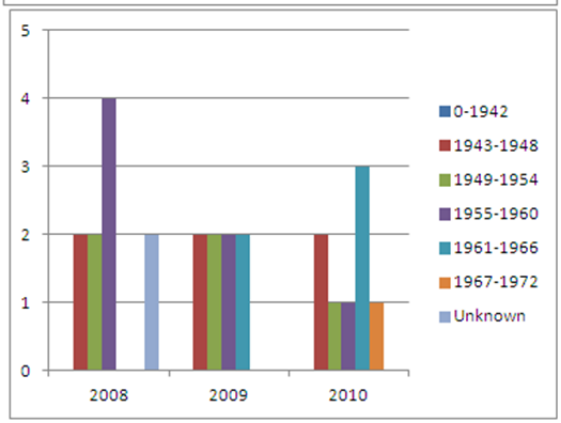
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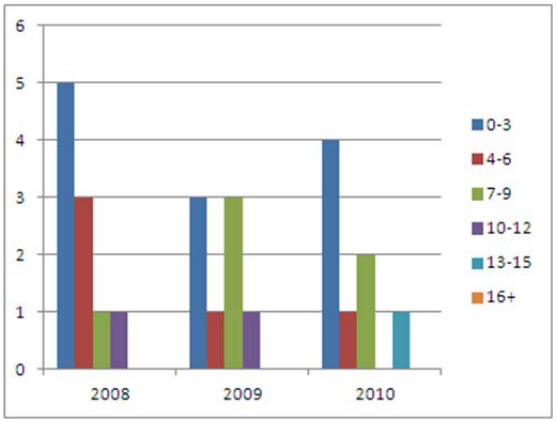
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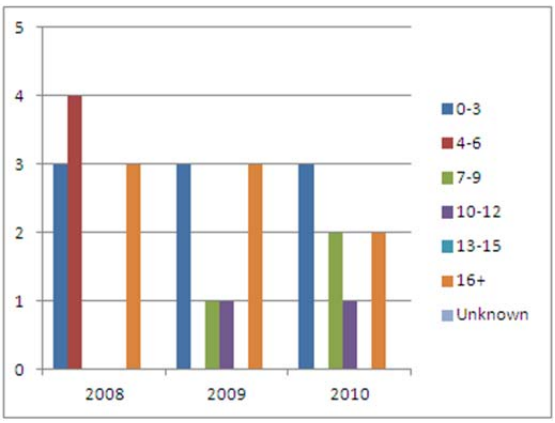
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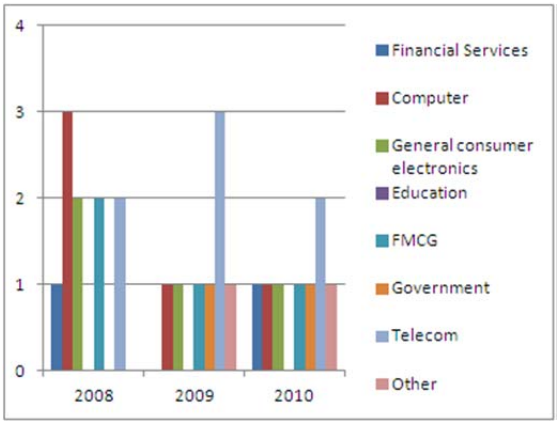
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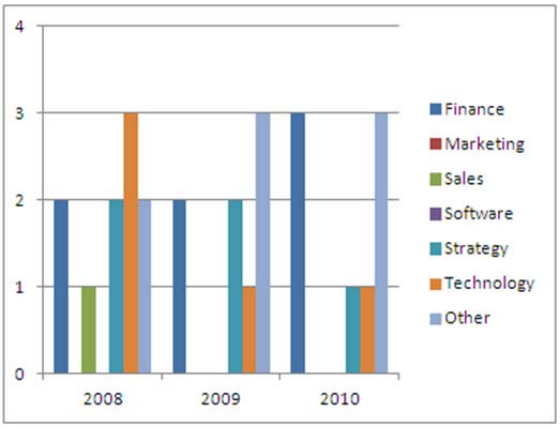
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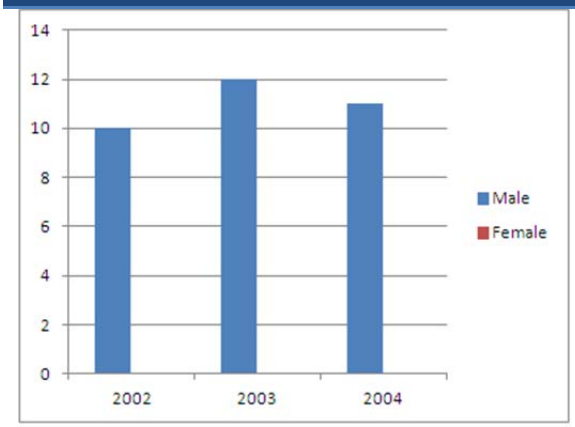
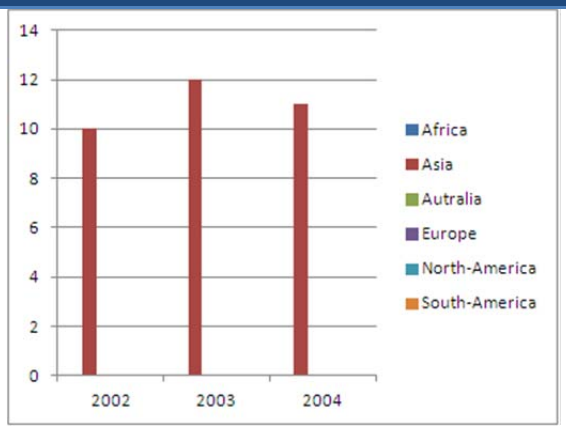
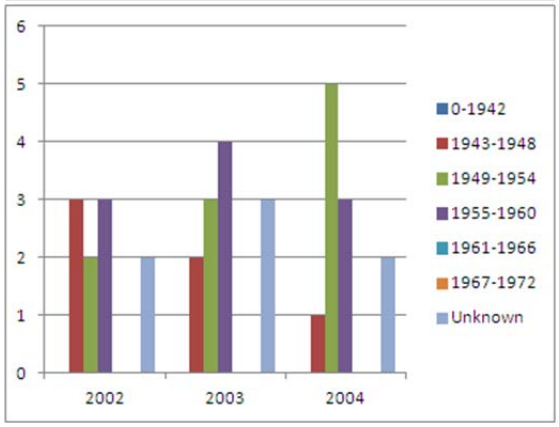
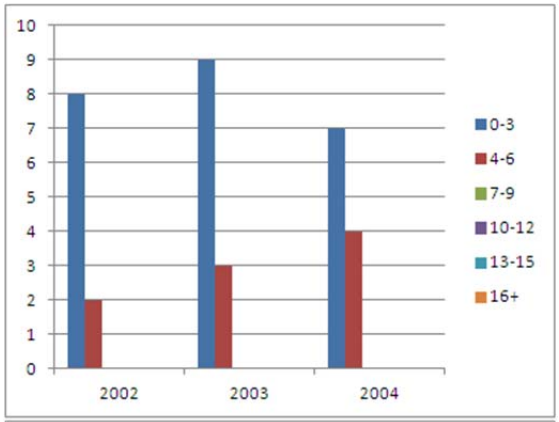
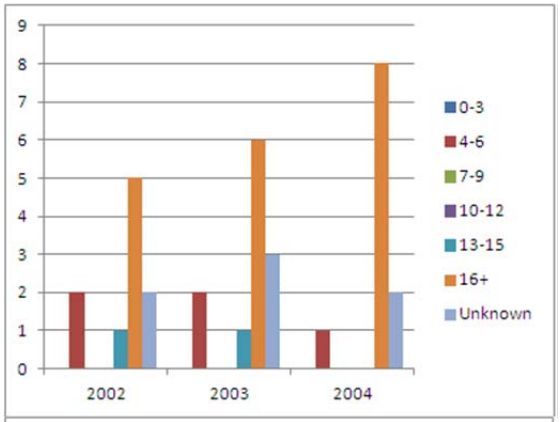
# Appendix 4: TMT members characteristics of LG

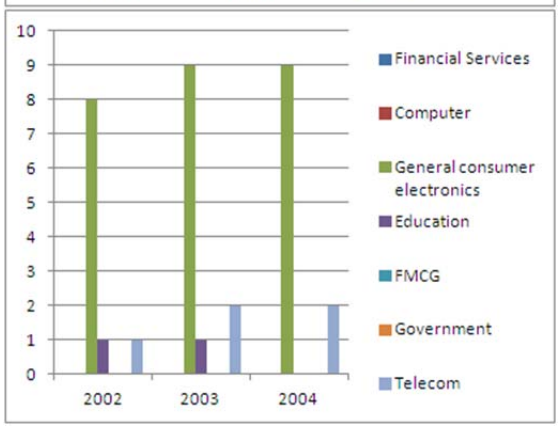


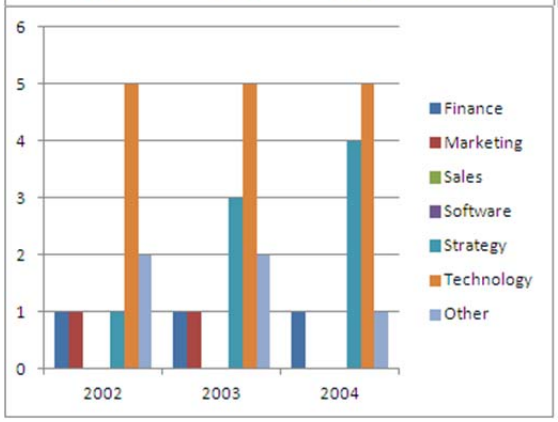



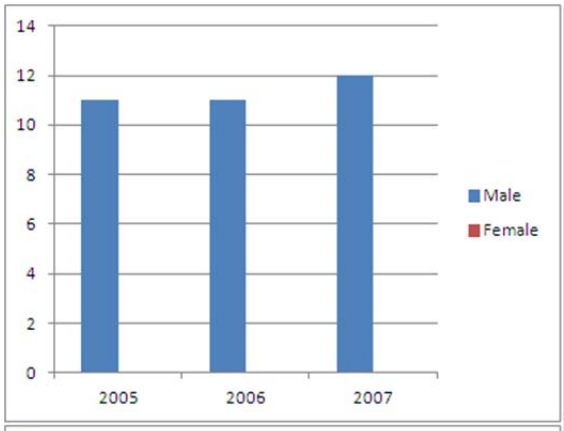

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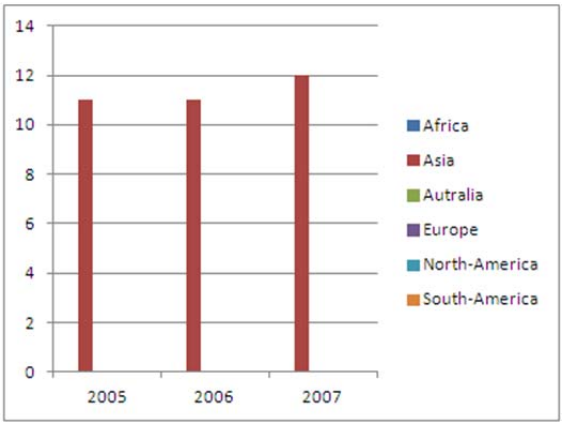
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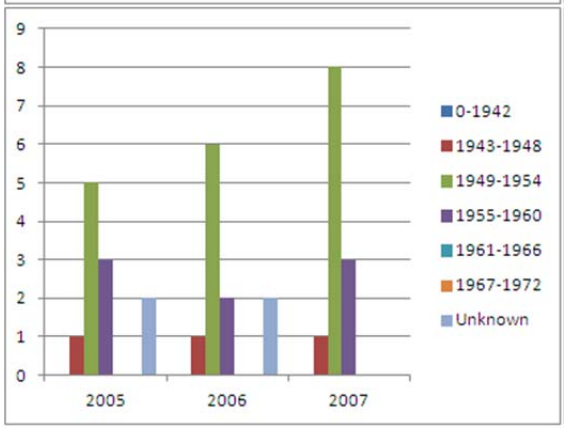
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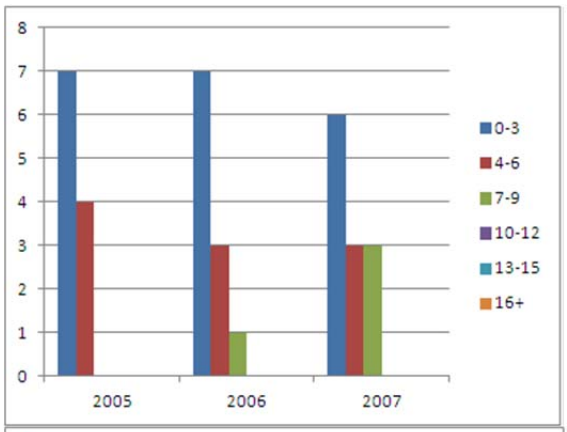
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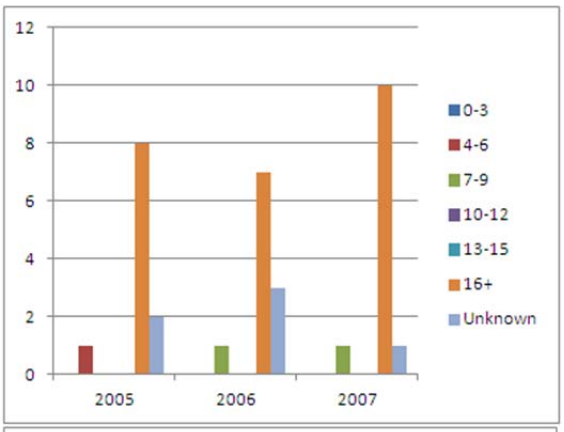
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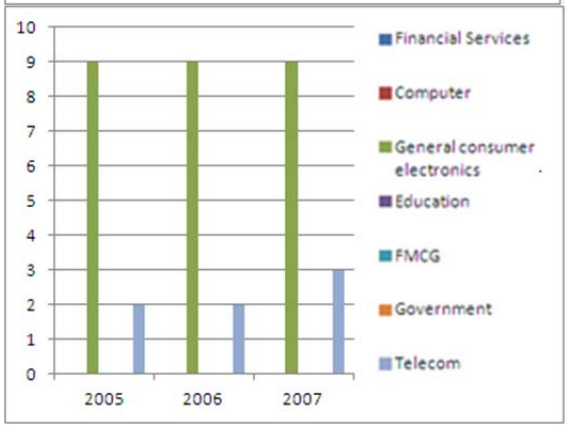
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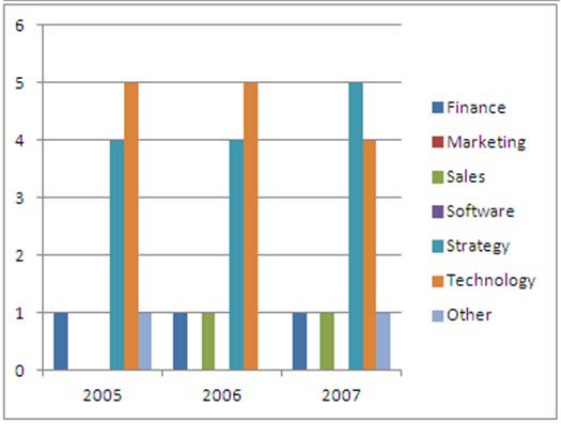
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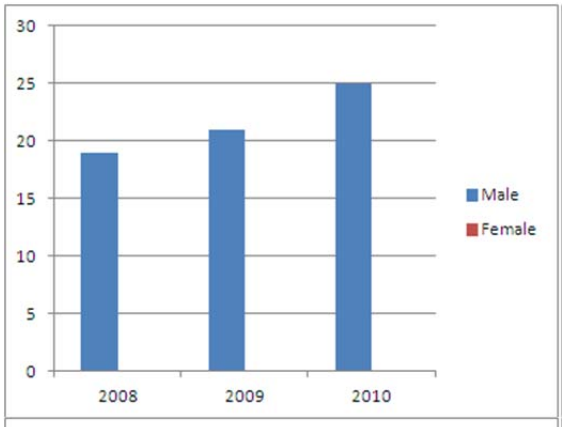
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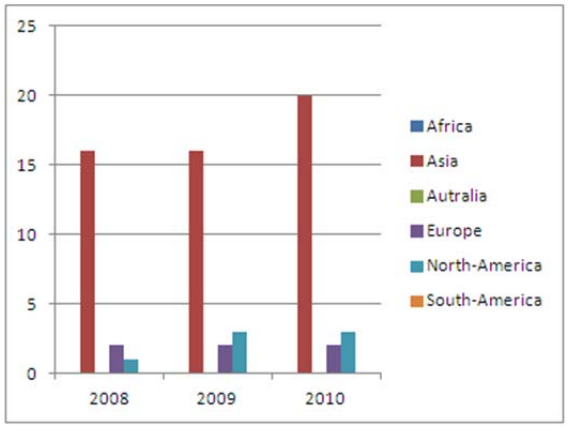
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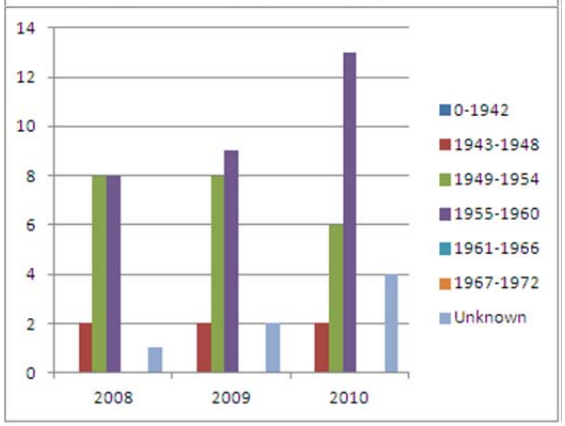
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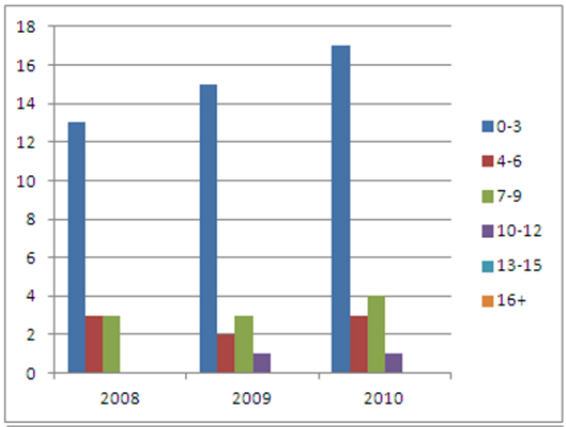
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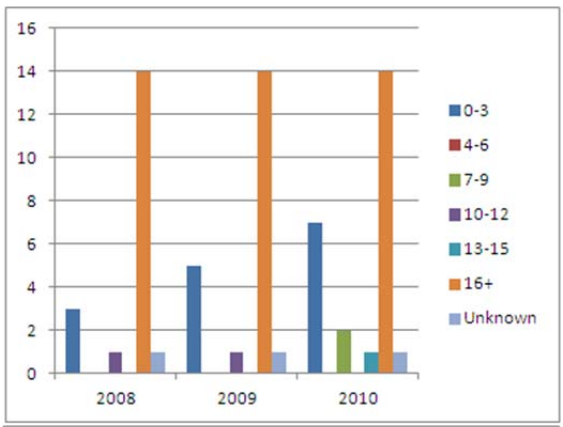
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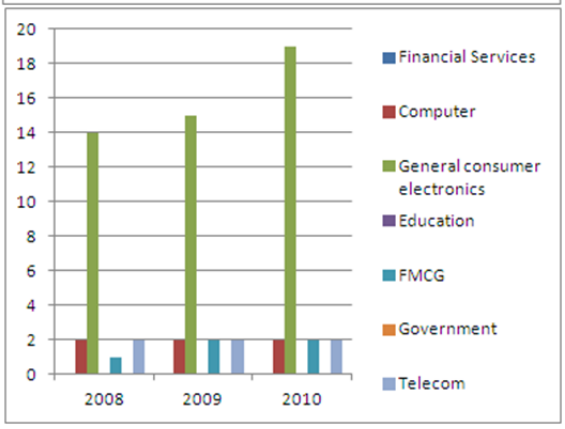
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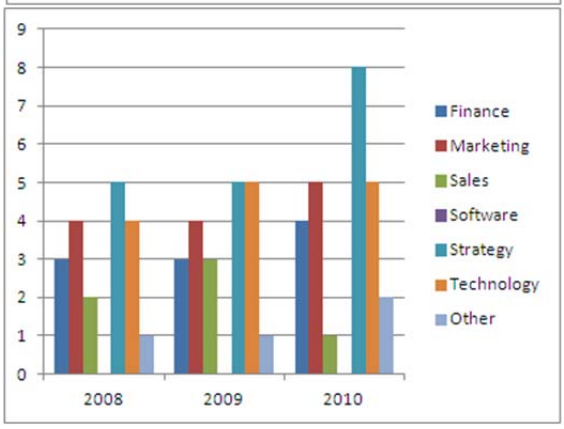
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