CREATIVE CONTROL
HOW TO MANAGE INNOVATION AND NEW PRODUCT DEVELOPMENT

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**ABSTRACT**

The topic of this research is to explore to what extent innovation and new product development (NPD) are managed with formal and informal control mechanisms respectively and in combination in five international food industry companies. The topic deals with finding an understanding of controlling innovation processes which require freedom to some extent but at the same time are to be managed in order to keep track of the resources. Cases’ selection was designed to bring variation and catch the complexity of the phenomenon by studying one prime case and validating the results with four minor case companies’ results. The findings of the study indicate that first of all formal and informal control mechanisms coexist and interact and secondly that a more informal and personalized take is beneficial in R&D settings.

*Key words: new product development, innovation, output control, behaviour control, cultural control, management style, control mechanisms.*
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1 INTRODUCTION

“I began to work on this book (Levers of Control) more than ten years ago with a simple question: How do managers balance innovation and control?” (Simons 1995: Preface)

15 years later, this question still stands – even though business management has evolved. Traditional views of manufacturing as a core competence have been rejected and outperforming competitors in terms of new product development (NPD) has become a relevant source of competitive advantage (Davila 2000; Cardinal 2001; Mukherji, Mukherji & Hurtado 2008). NPD entails innovation as companies produce new or significantly improved products or services (Innovation: the OECD Definition 2010). This is necessary for companies to be able to compete, grow and lead in a modern environment which demands adjustment to shortening product life cycles and to dynamic demands. To innovate is seen as vital even during times of recession when consultants warn that companies can damage their long-term competitiveness if they fail to innovate during recession – when traditionally companies tighten their purse strings (Ford 2009).

However, the story is not that simple. Innovation is risky and includes the challenge of managing the unknown and a fear of failure stifles the ability to behave in an innovative manner (The Economy Boost for UK Entrepreneurs 1999). Failure rates in NPD are high and organizations do not always possess innovation-friendly leadership styles. Organizations struggle in finding ways in which they can nurture ideas and initiative of their employees to come up with fresh ideas. (Humphries 2008) These aspects and attitudes ought to be refreshed as innovation and creativity are crucial elements for survival and can bring large share of a company’s sales and profits. These elements are jeopardized, however with the fear of failure and the tendency toward a short-term focus (Ford 2009). Under these circumstances it is not hard to understand that to motivate and be able to manage innovation is seen as highly fruitful for a company’s future (Zuckerman & Brajkovich 2003).

Research and development professionals possess critical knowledge inside companies and management of innovation should be handled in a different manner than other productive and routine operations (Cardinal 2001; Jørgensen & Messner 2009; Poskela & Martinsuo 2009). This is because R&D projects’ management success is impossible to estimate by traditional measures as performance and scheduled targets are yet to be fixed (Poskela & Martinsuo 2009). NPD management is about balancing efficiency and flexibility, as it is realised that innovation requires autonomy but then again control as management becomes vital in avoiding the production of less profitable products and services (Cray 1984; Persaud 2005; Jørgensen & Messner 2009).
Even though Simons (1995) intended to introduce a cohesive and comprehensive action-oriented theory of control to answer the question of how to balance innovation and control, 15 years later the current research of management control and its influence on performance in NPD contexts remain conflicting. For example, there is still debate about the optimal amount of control used and freedom given for creativity in R&D activities. Which control style to use is also inconclusive as some authors stress the importance of specific and challenging goals and, on the contrary, some emphasize the advantages of improved communication and coordination to foster creativity. (Poskela & Martinsuo 2009) Interestingly, some studies also mainly take management control systems as hindering or irrelevant in R&D settings (Davila 2000; Bisbe & Otley 2004).

1.1 PURPOSE

The present paper aims to contribute to this body of research by studying how managers can balance between giving independence to the innovative and creative R&D units and controlling them in order to perform efficiently. The formal management control mechanisms of output and behaviour control and the informal mechanism of cultural control are used in order to examine the management of new product development practices in five multinational companies. Interestingly, this “full range” of organizational management control mechanisms (output, behaviour and cultural (input) control) has been acknowledged to deserve more attention in NPD settings (Cardinal 2001). All these control mechanisms may be used together in NPD and research in this area has grown but most of the studies have solely focused on either formal or informal mechanisms. In fact, only one set of control mechanisms is not necessarily evident because the mechanisms are not substitutable but complementary to each other (Harzing 1999). The purpose behind the choice of these mechanisms was to bring an interesting “clash” as it is claimed that the formal control mechanisms block innovation whereas the informal mechanisms enhance the creative processes (Bisbe & Otley 2004). Future research should focus on studying how informal and formal control mechanisms coexist and interact (Cardinal 2001; Bisbe & Otley 2004). In addition, future research should investigate management control mechanisms’ holistic strategies in order to reveal the interdependencies between management control mechanisms in different contexts (Poskela & Martinsuo 2009).

In order to develop a better understanding of the phenomenon of NPD management, five international companies are chosen from a highly innovative industry, namely the food industry. According to Vishwanath and Blasberg (2006) winning food companies need to quickly customize their products for narrow segments and meet the differentiated demands from the consumers. As a matter of fact, consumers of today are the ones who foster new product innovation, for instance, by
insights of health and lifestyle trends (Bloch & Gruver 2007). In order to study this, a case study approach is selected to gain rich information about how NPD management works in specific in the chosen companies’ R&D units. This approach fits the nature of NPD management as it is said to be complex and cannot consist of traditional measures. Furthermore, as the control mechanisms can complement each other, a qualitative approach is needed in order to be able to reveal the style(s) of the NPD management with the rich information gathered from the five cases.

The research question is formulated as “To what extent is new product development (NPD) managed with output, behaviour and cultural control respectively and how are they used in combination?”

1.2 Disposition

The paper begins with a discussion of literature about management control mechanisms followed by summarized expectations which the authors of the present paper derived from the literature review. The following sections introduce the methodology, case study setting and the empirical findings. Subsequently, the last two sections present the analysis and conclusions, limitations and contribution toward NPD research.
2 LITERATURE REVIEW

Control has been identified as “the set of procedures, systems, and actions that managers use to monitor, evaluate, influence, or define what subordinates are doing” (Bart 1991: 6). Moreover, control is used as a means to implement the companies’ strategies. Going one step deeper, management control involves interaction with other members of the organization and entails the plans which are needed in strategy implementation. (Anthony 1988)

The definitions of control vary widely in previous literature and a number of scholars have defined control into various mechanisms, systems, terms and types (Harzing 1999). Management control system in particular is defined as “[…] information-based routines and procedures managers use to maintain or alter patterns in organizational activities” (Simons 1995: 5) with the help of formal control systems as well as informal personal and social controls (Ouchi 1977). These systems need to be adjustable as they must adapt intended company strategies as well as strategies emerging from experimentations and employee initiatives (Simons 1995). Thus as revealed by Simons already in 1995 a new theory of control in regard to innovation management was needed to balance competing demands and tensions. For instance, such tensions occurred between freedom and constraint, between empowerment and accountability, and between experimentation and efficiency. The art of management was not about choosing between the two alternatives, for example freedom and constraint, but to integrate both of them into organizations as is the case even today.

2.1 MANAGEMENT CONTROL OF INNOVATION

Innovation is by definition full of surprises which contradict control systems used in large companies to minimize surprises (Quinn 1985). Already in 1984 Rockness & Shields stated that R&D functions require control systems other than what traditional control systems can provide. For instance, standard costs, flexible budgets and variance analysis require the relationship between costs and activity levels to be known which is not the case in R&D functions. However, research proposed the opposite in the beginning of the 1990’s as Jelinek & Schoonhoven (1993) stated that the challenge of major innovation was impossible to expect to occur in an organic environment, where flexibility, consensus building and fluidity were the primary managerial mechanisms. According to them, breakthrough innovations require structure and clear reporting relationships which result in discipline and creativity. However, they recognized the need for unique processes in the sub groups and thus did not emphasize the need for a pure mechanistic hierarchical organization. In the same vein, Simons (1995) concluded his study of one hundred companies and determined that profit
planning and control systems were used more intensively in innovative companies than in less innovative ones.

Management control of NPD has been and remains controversial as Cardinal (2001) stated that the relationship between control and innovation is more complex than shown in previous research. This thought was derived from a small but significant stream of NPD research which all demonstrated different crucial aspects for innovation management. For example, structure and formality were seen as important to innovation, bureaucracy had beneficial effects in organizations, and less autonomy and some behaviour control were important for innovation, especially in R&D employees’ early careers. Moreover, even though Young and Tavares (2004) and Persaud (2005) summarized freedom and autonomy to have a positive effect on innovative potential, Taggart (1997) claimed that autonomy does not inevitably guarantee either innovative or cooperative behaviour. Furthermore, R&D units could act opportunistically rather than cooperatively with other R&D units, thus management of this phenomenon is highly interesting and important (Taggart 1997).

A key challenge for companies nowadays in regard to management control systems is to find a balance between efficiency and flexibility where the former is often captured in well-defined and controlled structures but the latter can be best achieved if employees are allowed to depart from routine activities. In short, the balance between efficiency and flexibility is particularly important in organizational units dedicated to innovation and exploration which need freedom but, at the same time, predictability and manageability as they construct the input for other more routine organizational units. (Jørgensen & Messner 2009)

2.2 FORMAL MANAGEMENT CONTROL

Formal control consists of high levels of output and process control (Cravens et al. 2002) and generally emphasizes written rules and procedures that identify subordinates’ behaviours and performances (Bart 1991). Traditionally formal management control systems have been identified as a hindrance to innovation and changes in organizations. Furthermore, the usage of formal management control systems in formulating and implementing innovation tasks, which entail uncertainty, experimentation, flexibility and freedom, has been said to bring only minor improvement (Davila 2005). These systems were said to be designed to block innovation in order to increase efficiency and to ensure that all processes create the value they are supposed to generate (Rockness & Shields 1988; Davila 2005). Nevertheless, a revised view by Davila (2005) suggested that these formal control systems can actually be flexible, dynamic and adaptable to the surprises created by innovation. Simultaneously, these control systems are stable enough to develop communication
patterns, routines and models. However, Poskela and Martinsuo’s (2009) study revealed that formal control mechanisms for example output-based rewarding (output control) and process formalization (behaviour control) have a neutral role with the regard to projects’ long-term aim of strategic renewal. They conclude these methods are more suitable in management control of short-term interest.

2.2.1 Output Control

Output control is an impersonal, formal (Chang et al. 2009) and administrative (Merchant 1981) control mechanism. It focuses on measuring the outputs realised instead of directly controlling the behaviour of the employees. These outputs are usually generated with the use of reporting or monitoring systems which can take many forms from general financial data to figures from sales, production, productivity and investments. Furthermore, with output control, specific goals are set for the employees who receive a considerable amount of freedom and autonomy to achieve them. (Harzing 1999) Headquarters that employ output oriented control systems employ formal procedures of specified resources and performance targets upon which they take corrective actions if deviations arise (Chang et al. 2009). In other words, output control is used when the performance can be controlled with a system that produces reliable and verifiable evidence of the output, thus heavy interference in the activities is not needed. To be able to use output control, the process in which input is transformed into output does not need to be known because this control system measures only the desired output. (Ouchi 1977) Merchant (1981) explained that the usage of output control is a consequence of growth of companies that became large, diverse and decentralized. Moreover, the structure of the organization influences the use of output control since highly differentiated structural forms create problems of measurement and evaluation of performance (Ouchi 1977).

Output control is said to be appropriate for tasks that are more non-routine and difficult to analyse as well as to those that are complex and interdependent with other tasks (Ouchi 1977). This was the original thought which was tested in an organizational level study of retail department stores which were differentiated from other organizations by hierarchy and a great deal of specialization. These original thoughts were supported but they inadequately described the control mechanism in the companies studied since the actual mechanism of control was found to be more complex than originally thought. Cardinal (2001) revealed another aspect in her study which investigated the influence of organizational controls on the activities of R&D professionals in pharmaceutical firms. For instance, she stated that output control leads to too much emphasis on incremental projects with more predictable outcomes and faster returns which would be smaller in the long run. This is
because the assessments of the potential payoffs of R&D projects’ accomplishment are difficult to determine in advance and thus end in less successful products. This resulted in R&D professionals focusing on project success or completion jeopardizing the development of revolutionary knowledge with longer payback periods. Rockness and Shields stated this already in 1988 in their study of several industries. The authors argued that it is highly difficult to obtain knowledge of the input into output transformation process in the R&D units and it is difficult to obtain measures of output. Zuckerman & Brajkovich (2003) stated the same by saying that R&D work is highly specialized and often done in small teams whose performance can be challenging to appraise. Finally, to measure the output might be challenging because some senior level managers may not have real understanding of evaluation of performance in the employees’ area. Zuckerman and Brajkovich (2003) found this in an employee opinion survey conducted by a global research based consultancy in 21 US companies.

It is expected in the present study that output control is relevant for decentralized companies and in particular for R&D intensive companies who wish to maximize the returns by investing less on the amount of managers present in the units. The usage of output control is expected to increase the flexibility needed in R&D settings as managers are not present in the transformation process but autonomy is given to the R&D employees. Additionally, efficiency can be accomplished with the fact that the managers’ training and involvement in the tasks is minimized and replaced with monitoring systems. However, the importance of being able to measure the output in advance and the short-term focus could limit the applicability of output control in R&D settings.

2.2.2 Behaviour Control

Behaviour control influences the behaviour of the employees directly (Harzing 1999; Chang et al. 2009) and represents a more interpersonal control strategy than output control (Merchant 1981). Behaviour control, referred to as a bureaucratic mechanism, enables the supervisors to guide and direct the subordinates with close personal surveillance (Ouchi & Maguire 1975; Ouchi 1979). Information necessary for task completion is contained in continuous rules and procedures concerning processes or standards of output and quality to be completed (Ouchi 1979; Rockness & Shields 1984). In order to apply behaviour control, the process in which input is transformed into output must be known before supervisors can rationally achieve control by watching and guiding the behaviour of their subordinates (Ouchi 1977).

In the above mentioned article by Cardinal (2001) it is stated that formalization through rules and procedures in problem solving restricts the capacity to deal with high levels of uncertainty
effectively. Additionally, frequent monitoring reduces the likelihood that the R&D professionals will continue with non-routine and radical changes that entail higher probabilities of failure. Cardinal (2001) emphasized that when the R&D professionals are controlled with behaviour control, they tend to concentrate their efforts on small improvements in order to demonstrate productivity for bureaucratic gatekeepers. Moreover, as a mechanism that stifles and inhibits creativity and fosters employee dissatisfaction, bureaucratic control has been renowned even earlier (Aiken & Hage 1971; Adler & Borys 1996). However, Persaud (2005) suggested in his study of synergistic innovative capability that behaviour control might be needed as autonomous units may commit opportunistic behaviour which reduces the contributions to innovative capability. These results were obtained from 79 R&D units in five different industries. Furthermore, behaviour control creates administrative costs because the managers must observe the actual performances’ value (Ouchi 1979).

To conclude, the debate about behaviour control’s impact on NPD remains inconsistent as it is said to “kill creativity” but on the other hand to enhance communication and coordination (Poskela & Martinsuo 2009). In their study of investigating how management can effectively control the front end of innovation in a product innovation context, behaviour control’s negative association to strategic renewal gained only weak support. Finally, usage of behaviour control was justified with its clarity. (Poskela & Martinsuo 2009) Furthermore, the findings of Zuckerman and Brajkovich’s (2003) previously introduced study showed that immediate supervisor input and direction were needed to effectively manage researchers who felt that managing through directives from top management without local level support was likely to be ineffective.

From this review, the debate around behaviour control impedes clear expectations’ development as pro and con aspects remain equally strong. However, in today’s highly dynamic and modern business environment, it is expected that companies would not endanger innovation activities in any manner. Thus behaviour control would not be an obvious choice for companies because of its deteriorating reputation for the R&D units’ creativity and flexibility. Additionally, it is seen as a costly choice. Even though communication and coordination are said to be enhanced, it is proposed that behaviour control is not the most relevant in R&D settings as it is considered to be a hindering element for NPD.

2.3 INFORMAL MANAGEMENT CONTROL

Informal control includes high levels of cultural control (Cravens et al. 2002). It is said that management control system cannot remain formal and static when work requirements become more uncertain, complex and changing. Rather, management must employ a cultural control system that supports autonomy, creativity and the judgment of employees (O’Reilly III & Tushman 1997).
Hence, R&D units in particular are said to rule out formal management control systems and to implement the informal ones that count on social norms (Ouchi 1979).

2.3.1 Cultural Control

Cultural control is informal and relies on subtle ways to control (Bart 1991; Chang et al. 2009). Employees behave in accordance with the company “way” as control is based on a broad organization-wide culture (Baliga & Jaeger 1984). The culture may entail a specific language, ideology, rituals and comprehended organizational codes that shape the employees’ behaviour. Cultural control focuses on ensuring that the norms and values of individual employees are congruent with those of the whole organization (Chang et al. 2009). Ouchi (1979) argued that companies employ cultural control when they are unable to use either output or behaviour control mechanisms; in other words, it is impossible to measure the output or to know the transformation process of input to output. Cultural control includes recruiting only a selected few individuals who have been through a schooling and professionalization process which has taught them to internalize the desired values. Therefore, the selection of employees and long-term employment are of prime importance as together they facilitate the existence of the specific organizational culture (Baliga & Jaeger 1984). In addition, training and socialization are important in organizations utilizing cultural control since a member must not only learn the rules and regulations but s/he must also become a part of a subtle and complex control system with a broad range of organizational values. Monitoring in a pure cultural control system occurs through interpersonal interactions, expectations and shared agreements.

O’Reilly III and Tushman (1997) found that social (cultural) control was utilized in R&D, consulting, technical specialities and all service jobs which were characterised by unpredictability and frequent change. Thus a form of social control is needed to allow autonomy and to trust the judgment of the employees who understand the vision and objectives of the organization. These observations are presented in O’Reilly III and Tushman’s (1997) book in a case company called NUMMI plant where social control supplanted or supplemented formal control mechanisms. Rockness and Shields (1984) concluded similarly by stating that it is impossible and inefficient to control the outputs of R&D units in monetary terms and therefore social control allows a more timely manner to monitor. They revealed these aspects in their study of control framework in R&D settings in ten US organizations by studying the R&D workgroup supervisors.

According to recent research, development of innovation systems depends on a complex set of rules and frames but no single actor can be in control of these rules and frames (Pohlmann et al. 2005).
Pohlmann et al. (2005) concluded that cultural control is the only way to manage NPD settings as innovation management is said to require a social system and increased interplay among different actors in the innovation process. What remains challenging with cultural control is that R&D professionals often consider themselves to be scientists and thereafter only as a part of an organization (Zuckerman & Brajkovich 2003). In fact, Zuckerman and Brajkovich (2003) stated that to manage R&D employees effectively requires a thorough understanding of the unique attitudes and perspectives of the R&D employees and to be able to preserve these as much as possible. This was already revealed in Cardinal’s (2001) study of R&D professionals in pharmaceutical industry where she found that scientists would choose to serve professional norms over those of the organizations.

In conclusion, this study expects cultural control to be utilized predominately in the NPD management because of the characteristics of R&D tasks being uncertain, unpredictable and hard to measure in advance. Therefore management control should be adjusted and incorporate flexible elements that allow creativity-enhancing autonomy and do not focus on measuring the immeasurable. Norms, language, values and rituals represent these kinds of dynamic and flexible elements for NPD management. Cultural control brings cost efficiency without creativity-dampening control mechanisms of surveillance and monitoring and thus builds an innate control of the R&D unit.

2.4 SUMMARY

The present paper’s expectations in regard to the usage of management control in NPD settings derived from the literature review are summarized in Figure 1. It is expected that all the control mechanisms are used in NPD management but, as mentioned above, cultural control is expected to be in use primarily, output control secondarily and behaviour control thirdly. Thus, even if the mechanisms would be combined, it is proposed that cultural control stands out the most.

![New Product Development Management](image)

*Figure 1. New product development management’s expectations.*

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3 RESEARCH DESIGN AND METHODOLOGY

The aim was to study how managers can balance giving independence to the innovative and creative R&D units and controlling them in order to perform efficiently. The present paper contributes with an exemplary empirical clarification in a form of a case study method. This choice enabled to catch the complexity of the phenomenon and provided a possibility for more thorough data of study objects under the circumstances of limited time and resources. This study was based on one in depth case which was accompanied by four other cases. This offers possibilities for a more complementary and synergistic information gathering and data analysis (Leonard-Barton 1990). In order to find out to what extent the case organizations employed the above mentioned “full range” of control mechanisms, the analysis took place at unit level by analyzing the management of R&D units. These units are said to represent such working environments where employees are motivated by freedom to explore new ideas (Zuckerman & Brajkovich 2003) and consist of practices that “rely on ideas and experimentations” (Jørgensen & Messner 2009: 100).

3.1 CASE SELECTION

Food industry was found interesting because of the challenges that the producers face: fragmentation of consumers’ demands along ethnic, channel and geographic lines as well as rapidly changing consumer health-related trends. The need for innovation has rarely been greater as keeping products fresh is not necessarily simple when product margins are tight and competitors can quickly steal each other’s novel ideas. (Vishwanath & Blasberg 2006) Additionally, as people live in the midst of versatile nutrition choices, NPD offers various possibilities for the companies in facing the new demands. For instance, the companies have reacted to changing health-related trends as 60 percent of the corporate respondents had changed their production composition by decreasing salt, sugar and fat and by inventing even healthier products according to a survey made by the Finnish Food and Drink Industries’ Federation (2007). Presently there exist symbols and labels such as “The Keyhole Symbol” and “GDA” (Guideline Daily Allowance), which provide product ingredient information (National Food Administration 2010; Food and Drink Federation 2009). Companies are thus competing for media’s and independent stakeholders’ acceptance by trying to increase the transparency of their operations and product compositions in order to meet the increasing demands from the consumers’ side.

The criterion for case selection used was firstly to identify companies facing a similar challenge of innovation. This was revealed by searching for companies with similar history and approximately the
same size in terms of revenue (less than 1.5 billion Euros) and personnel (less than 20,000). Large and widely known multinational food producers were excluded as it was thought that smaller players would show more innovation with fewer resources. Among these smaller players, companies that were similar in regard to heritage, national culture and age were selected in order to hold these variables constant. A second requirement was that the companies had recognized innovation as an essential element of their operations. The companies had contributed to this phenomenon by constantly developing their product assortment and by being involved with external actors such as research centres and health associations. The third requirement was companies’ operations’ internationality as it was assumed that their adaptability to foreign and local demands showed their ability to develop new products for different target countries and target groups. NPD would be at a higher level in comparison to companies active only in one country. The five companies that passed the criteria are leading actors in bakery, confectionery, convenience foods, dairy, functional foods, meat and poultry operations and food services (Appendix 1).

Interestingly, the chosen companies state themselves that a change in customers’ awareness toward food is the challenge nowadays. For instance, one company was among the first to offer sugar-free candy and states that innovation and a more holistic concept without artificial ingredients responds to consumers’ demand about health and wellness (Prime case: Press release 2009). Another company argues in the same vein, consumers have become increasingly knowledgeable in regard to what they want (Minor case A: Annual Report 2008). Another company remarks that the basic products’ development and variation is necessary since consumers’ demands and diets change - the product life cycle of an individual product is usually short (Minor case B: Company website 2010).

Selection of the cases was done with the aim to gain an overall picture from the industry and thereafter to gain deep and thorough data about one company’s NPD management mechanisms in particular. This particular company, the Prime case, was selected because of its R&D resources’ exceptional internationality, R&D unit’s relevant size and innovation intensity. The Minor case companies’ findings were used to reflect and validate the Prime case’s management style. Anonymity was assured to all participants as NPD and innovation management was experienced as a sensitive matter by the companies.

### 3.2 DATA COLLECTION

The research was based on three types of data collection: surveys, interviews and studying secondary data. Primary data was collected by surveys and interviews which provided the opportunity for an in-depth field study. The primary data was gathered in three stages (Appendix 2) as the companies were
firstly interviewed in order to agree upon their participation, thereafter a survey was sent to them and finally interviews were held with a randomly selected pool of participants. Sources of secondary data included the chosen companies’ publications such as annual reports, media releases from nutrition associations as well as releases from consulting companies’ studies in the food industry.

The survey (Appendix 3) was composed of eight questions from which four were open questions and four matrix questions using a five-level Likert scale. The survey was tested with a former employee of one case company as well as with the R&D director from the Prime case. It was provided in multiple languages and it was proof-read by native speakers in order to match the respondents’ language skills. The survey was internet based and took approximately 20 minutes of the employees’ time.

The interviews (Appendix 4) took place with randomly selected members from the Prime case’s R&D unit and 15 questions were posed to them. The questions were derived from the Prime case’s employees’ answers to the survey as more multifaceted information was sought about specific topics. More freedom and a possibility to elaborate the answers were provided during the semi-structured interviews in comparison to the survey. The interviews lasted from 30 to 45 minutes and were conducted in the respondent’s preferred language.

3.2.1 Response rate

Prime Case

After interviews with the R&D manager and the R&D director, Prime case’s participation was confirmed and the survey was sent to the whole R&D unit consisting of 48 employees in six different countries. Ten days were given to fill in the survey. The response rate was 54 percent as 26 responses were gathered from five countries.

The interviews took place after the survey had been completed. Six randomly selected persons were proposed to be interviewed and they were all willing to participate. Five of the semi-structured interviews took place by phone and one was done face-to-face. This was because one respondent was conveniently located whereas the rest of the respondents were reached in three other countries. Despite the distance, an atmosphere of trust was created and the respondents revealed that this method was seen as convenient for more elaboration, sharing detailed information and the respondents’ individual perceptions. The interviews were recorded which did not seem to restrain the participants as they spoke freely. Immediately afterwards, the interviews were transcribed and translated into English, if other languages had been used. In order to secure the accuracy, notes were taken during the interviews to complement the recordings.
**Minor Cases**

Ten other companies in the food industry were firstly contacted via telephone in order to receive their R&D units’ contact details. Thereafter, short interviews were held with the R&D directors as they and the whole R&D units were proposed to participate in the same online survey (Appendix 3). Four R&D directors from four companies participated resulting in four completed surveys. Interviews were not held due to the respondents’ strict time limitations even though this would have increased the reliability of the study. However, as the aim with this paper was to provide an in-depth study of one company’s R&D units’ management and to use the minor cases as complementary, the authors did not feel the lack of interviews had severe impacts on the results.

### 3.2.2 Measures

The survey questions were designed firstly to depict how the respondents perceived and described the present management style. Respondents answered to two open questions of how they were managed and how the management influenced NPD and their innovative behaviour. In addition, they were posed Likert scale questions (1=Not at all, 5= to a great extent) in order to see whether the respondents perceived the current management style to support or restrict the creativity, flexibility and adaptability; and hence, innovation and NPD. Furthermore, questions were posed about management in regard to different products and departments and whether management’s perception toward innovation was market proactive or reactive. This was asked as according to Cardinal (2001), Jørgensen & Messner (2009) and Poskela & Martinsuo (2009) R&D departments and innovative products should be managed in a different manner than those of rest of the company. Secondly, the answers to the above mentioned questions were later on compared with the answers to questions about improvement areas in regard to NPD and innovation management. The purpose of the improvement area question was to see whether the present management style could be developed and whether a different control mechanism would be seen as more appropriate according to the respondents. The answers to these questions were further elaborated in interviews.

The survey and interview guide were formulated so that the questions were scattered and thus were not presented in groups of respective control mechanisms. Output control was measured by finding out whether the departments or senior management were involved in the development process (Johne 1984) which would show the level of autonomy and freedom of the departments (Bart 1991). Furthermore, it was seen necessary to know whether the managers were/were not aware of the transformation process of input into output. If managers did not interfere or influence the transformation process, it would show the level of autonomy to be higher as was mentioned in the
literature review to increase creativity (O’Reilly III & Tushman 1997). The respondents were then asked whether they were managed by setting clear final goals and targets to perform. As mentioned in the literature view, output control was seen as inefficient because the complexity and uncertainty would hinder the measurability of output in advance. Thus the respondents were asked on a Likert scale (1= strongly disagree, 5= strongly agree) to describe whether complexity and uncertainty of their work would make it impossible to set clear targets. The answers were further elaborated in the interviews by asking about the irregularity of the respondents’ working days.

Behaviour control was operationalised by posing questions about the level and frequency of personal surveillance and the managers’ formal presence, interference, rules and regulations as well as procedures and standards (Bart 1991). Furthermore, the answers to the question of whether management knew the different phases of the respondents’ work would also reveal the possible usage of behaviour control. Hence, if the managers were aware of the transformation process (phases of the work), behaviour control would have been the most expected control mechanism used. It was acknowledged that behaviour control and cultural control overlapped in the sense that both forms include active and involved managers. Thus it was important to pose a question about manager’s role being either formally involved, as in the behaviour control, or socially engaged, as in the cultural control. Cultural control was further measured by asking about duration of the employment, and further elaborated in the interviews by asking whether there were benefits for long-term employment, which was mentioned as a facilitator of a specific organizational culture (Baliga & Jaeger 1984). Respondents were also posed questions on a Likert scale (1= strongly disagree, 5= strongly agree) about their participation in team spirit enhancing activities and events and whether they found themselves loyal toward the company and toward their colleagues. In the interviews, the respondents were to elaborate these questions as they were asked about the frequency (Bart 1991) and formality of meetings with managers. Finally, respondents’ were to answer on a Likert scale question (1= strongly disagree, 5= strongly agree) whether they felt responsibility for their work, which would show that the respondents felt committed toward their work and were trusted and were allowed autonomy (O’Reilly III & Tushman 1997).
4 Empirical Findings

The interview guide and raw data from the surveys can be found in Appendices 4, 5 and 6. The answers for the matrix questions were coded in three groups: agree (Likert scale 4 and 5), neutral (Likert scale 3) and disagree (Likert scale 1 and 2). This coding enhanced clarity of the visual representation as it emphasized the differences in opinions more explicitly. In addition, answers to open questions (the respondents could mention several aspects) were coded in regard to appearance of similarity. Every respondent’s answer was firstly listed and then grouped into themes which were formed if the answers’ aspects were adequately similar (for example, innovation courses and creative events were seen as similar to each other).

4.1 Prime Case

In the Prime case, the survey respondents stated that management varied between different products (76 %) and between different departments (81 %). According to the interview respondents R&D and marketing were given more freedom and were flexible in comparison to production which was in line with company directives. One of the interviewees even stated that for R&D “freedom is necessary in order to think non-conventionally and outside the box”. The need for adjusted management was also revealed when interviewees all stated their work to be highly uncertain and complex so that regularity did not exist and adjustment was needed.

Separate questions were asked about whether senior management’s perception of innovation was proactive or reactive. Larger group of respondents stated it to be market reactive (73 %) but, interestingly over half of the respondents stated it to be market proactive (54 %) when asked in the opposite question. In order to find out how the employees perceived and described to be managed, an open question was posed and three major styles were coded: firstly, the managers were said to be project distributors and delegators who prioritized and guided the employees in order to avoid work overloads (27 %); secondly, employees felt that they were managed by given responsibilities and freedom (27 %); thirdly, employees perceived the managers to create open and honest communication as well as to build trust (19 %). Among the other responses, managers were perceived as team builders, who coordinated learning and creative meetings; who were knowledgeable, experienced and supportive helpers. Moreover, managers were perceived to give clear goals and feedback as well as encouragement “to reach full potential”. Due to various answers to this question, the topic was further elaborated in the interviews when it was revealed that the employees were given responsibilities and freedom for their work (four respondents), that managers
created open and honest communication (one respondent) and that the manager was a project distributor and delegator (one respondent).

In terms of how the management influenced the NPD and the employees’ innovative behaviour, yet again three major aspects were distinguished from this open question. Firstly, managers’ encouragement for innovative behaviour was seen as influential (31 %); secondly, managements’ approval needed to be gained before project progress (24 %); and thirdly, managers “coordinate the most important milestones” (19 %). Furthermore, time limits, strategic targets and lack of long-term planning restricted NPD. Brand strategies and brainstorming sessions were also mentioned to have an influence on the innovative behaviour (12 %) and importance of having an encouraging and innovative environment to enhance NPD was emphasized (12 %). This question was elaborated in the interviews when three of the respondents stated that their manager only coordinated clear milestones and one respondent revealed that her/his manager encouraged the innovative behaviour tremendously. This was also stated by another respondent who added that new products have many procedures and regulations that need to be followed and the last interviewee stated that approval was always needed in order to proceed.

Output control

Output control was covered by asking eight questions that measured goals, objectives, measurability of outcome in advance and the independency of the employees’ work (Appendix 5: red colour). The survey respondents agreed that their line manager set final goals and objectives (68 %). Furthermore their objectives were clear (88 %). Neither the measurability (68 %) nor the uncertainty (76 %) of their work was considered as an issue for setting the objectives in advance. Not even the complexity of the innovative work was found to be the reason why clear objectives would not be set (68 %). The senior management was said to be in charge of NPD (67 %). However, when asked the contrary in another question, the departments were also said to be in charge of NPD (69 %). Finally, the respondents stated to have worked independently (58 %) even though some stated otherwise (35 %).
In the interviews, all mentioned that senior management was not involved actively but, however, it was them who set targets, approved the projects and followed their implementation on a high level (by controlling the procedures’ “gates”). Nevertheless, the interviewees revealed that the senior management did not know the different phases of the employees’ work on a detailed level and it was actually stated by one respondent that the senior management was endeavoured to be more closely involved as “because without their support one cannot become fully successful in the (R&D) process”.

In regard to setting the targets in advance, the respondents stated that they had both personal objectives (three to five per year) according to which they were measured as well as financial and volume targets such as net sales value and profit from previous year. Furthermore, R&D targets were a mixture of innovative and administrative targets. Finally, all the interviewees revealed to work highly independently.

In summary, output control seems to be applicable as final goals and clear objectives could be set, in other words, the uncertainty and complexity of the respondents’ work were not seen as a hindrance for output’s measurability in advance. Majority stated also to work independently. Finally, even though senior management was unaware of the different phases of the employees’ work, the survey findings question output control’s suitability as senior management was not clearly in charge of NPD.

**Behaviour control**

Behaviour control was measured by asking questions about the formality and the frequency of the line manager’s presence and knowledge of different phases of the employees’ work as well as whether line manager set up temporary goals, objectives, rules and routines to which to adhere (Appendix 5: green colour). The survey respondents revealed that their line managers were formally present (56 %) and that they set up temporary goals and objectives (64 %). The answers to the
question of line manager being constantly present varied from disagree (36 %) to agree (36 %). The majority (85 %) stated that their line managers were aware of the different phases of the employees’ work. Finally, the respondents’ work followed rules (96 %) and routines (85 %).

![Figure 3. Behaviour control findings.](image)

In the interviews it was revealed that the line managers were more closely involved and informed about the different phases and procedures of the interviewees’ work than the senior management but were hardly informed about particular details. The interviewees stated that although they had telephone meetings when necessary, meetings with line managers were held at least once a week and with the R&D colleagues two to four times a year. These meetings were formal only on special occasions but telephone contacts were informal when the interviewees could “share all their worries and ideas freely” and the employees were delivering together “what needs to be done”. No close connection was found as “We have agreed that if there were issues I will let him/her (the line manager) know, otherwise I run the job. I mean s/he can see that I deliver. So there is no reason for him/her to interfere”. However, the higher one was situated in the company, the closer was the contact as one interviewee claims that “You have to have close daily connection when you are involved in project management”. In addition, rules and regulations were found as one of the interviewees stated “We have these processes and gates in the company that everyone has to follow; there are lots of documents to be filled”. Finally, routines were found in the form of daily rituals such as product tasting sessions.

In summary, the survey findings suggest that behaviour control was in use because the managers were perceived to know the different phases of the respondents’ work as well as that the respondents followed rules and routines. However, according to the interviewees, the line managers did not know the details of the phases and procedures. Interviewees agreed that the managers were not constantly present and stated that when meetings were held, they were not formal except in few occasions. Thus the findings provide only weak support for behaviour control’s usage.
Cultural control

Cultural control was operationalised by asking seven questions about how long the respondents had been employed, whether they were given training in the beginning and later in the career and participated in staff events, whether they felt responsible for their work and loyalty toward their colleagues and the company (Appendix 5: blue colour). The average duration of employment was calculated to be 9.5 years. The majority (62%) declared their line manager was an active and engaged team member. The majority also agreed that they were offered internal training in the beginning (63%) and later during their employment (70%). Moreover, all agreed they felt responsible for their work and to feel loyal to colleagues and to the company (92%). Finally, the respondents revealed they participated in staff events and team building activities (76%).

![Figure 4. Cultural control findings.](image)

When the interviewees were asked about long-term employment benefits, all clearly stated that apart from the regular 10, 25 and 40 year bonuses, long-term employment was not valued. The average employment duration of almost ten years was explained with the fact that R&D work was experienced as complex and took years to become familiar with, hence some of the employees tended to stay but in overall the turnover rate was high. Bigger emphasis was placed on the fact that everybody needed to contribute and as one interviewee stated: “If you contribute to the success of the company, that is valued and if you don’t contribute, they want to see you leave”. In terms of trainings and staff events, the interviewees were in favour of these and regarded them as valuable and idea generating events. Apart from team building purposes, they were seen as educative events that could bring increased synergies between different regional units’ knowhow and experience: “I am in favour of the trainings and I think that every company needs to be up to date about the things that are moving in terms of human resources [...] I think that we should have and we already had a continuous training approach”. Furthermore: “This is a point that is in the top of the agenda of
human resources in our company”. In regard to loyalty, the opinions were divided as three felt more loyalty toward their colleagues while three others felt more loyalty toward the company (the interviewees in higher positions felt more loyal toward the company).

In conclusion, the findings from the survey imply that cultural control is suitable as all felt responsible for their work as well as loyal toward their colleagues. The majority of the survey respondents were loyal toward the company and participated in various staff events and trainings offered. This was further supported as the interviewees stated that they saw the staff events as educational and highly valuable. Furthermore, the survey respondents regarded managers as active and engaged team members. However, the interviewees revealed that no long-term benefits existed which contradicted the elements of cultural control.

Improvement Areas

As was mentioned above, the survey included questions about improvement areas in order to find out whether the present management style was regarded as necessary to be developed. The intention was also to find out whether the respondents would name aspects that could be connected to another control mechanism. The survey respondents assessed whether the present management style enhanced or diminished creativity, flexibility and adaptability. Disparity was found as 42 percent revealed that the management of their tasks enhanced creativity. Logically the rest (58 %) would have stated the opposite or were neutral but when asked in a separate question whether the management of their tasks diminished their creativity, only 28 percent agreed with this. Thereby, 15 percent argued that the management diminished their flexibility but 42 percent stated the opposite. In regard to adaptability, 17 percent stated the management diminished the adaptability to external challenges while 42 percent said it enhanced the adaptability. The question about how to increase the employees’ creativity was further elaborated in the interviews as two of the interviewees wanted increased freedom, two were in favour of increased professional guidance and the remaining two revealed creativity to require innovation courses and more time: “I have all the tools needed: the databases, Internet, colleagues, trainings provided but what I am missing is time”. Moreover: “We always talk about that we should be very creative but when you have a very busy day you find it hard to take time out and to do something creative”. In regard to adaptability and flexibility of the work, three of the interviewees wanted more professional guidance, two desired more resources and time and the remaining one wanted more freedom.

When asked about how the management of NPD and innovation could be improved, yet again, four major themes were coded from the answers to the open question, firstly provision of more resources
both monetarily and time wise was needed (50 %); secondly, innovation courses and training, brainstorming and creative events were seen as areas for improvement (26 %); thirdly, more collaboration and involvement with other units such as marketing, supply and sales were said to make a difference (23 %); and fourthly, focus on long-term research was seen as beneficial (15 %). In addition, team building and cross-team activities as well as synergies with other companies were mentioned as necessary. Moreover, company’s philosophy in regard to innovation was said to need improvement so that “we have to be the first with innovative products and not be a follower”. Management-wise it was mentioned that employees should be granted more information, rewards for innovative behaviour and more space for NPD. Organization-wise, bureaucracy and administrative processes should be diminished. Five of the interviewees clearly stated that the management could be improved by providing total freedom for the employees to achieve the targets.

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Dissimilarities</th>
</tr>
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</table>
| **OUTPUT CONTROL** | Clear targets  
No heavy interference  
Immeasurability not an issue |
| | More time wanted  
More involvement wanted from the senior management  
More focus on long-term |
| **BEHAVIOUR CONTROL** | Temporary goals and objectives (gates, standards)  
Line managers more aware of the employees’ work |
| | Line managers not completely aware of the employees’ work  
More freedom wanted |
| **CULTURAL CONTROL** | Specific norms, rituals (tasting sessions)  
Informal meetings  
Responsibility for own work  
Freedom  
Loyalty towards colleagues and company  
Training provided and valued  
Staff events provided and valued |
| | No long-term employment benefits |

*Figure 5. Prime case findings.*
4.2 Minor Cases

All of the four companies supported the statement that management varied between different departments. In regard to whether management varied between different products, two respondents agreed and two were neutral. When asked about senior management’s perception regarding innovation, the respondents were inconclusive: three of the respondents said management to be proactive but when asked the opposite in a separate question, yet again three of the respondents said it to be reactive. With similarities to the Prime case, the respondents from the Minor cases perceived to be managed by setting up personal performance targets and goals (in line with company’s strategic targets) without daily guidance. Meetings were also held regularly in order to follow up that the goals and objectives were performed and furthermore meetings were held to develop and set action plans for the departments.

In terms of how the management influenced the NPD and the employees’ innovative behaviour, three respondents said that managers were seen as coaches rather than supervisors which was also recognized in the Prime case. Overall, current supervision was not perceived to have a negative impact on innovative behaviour on either case. Two respondents emphasized that good structure and strategic planning aided their innovative behaviour but one respondent revealed that tight schedules and the large number of projects had a negative impact on the innovative behaviour.

Output control

The respondents’ answers differed in regard to whether their line manager set final goals and objectives: two agreed, one stated neutral and one skipped the question. In regard to whether the respondents felt that they had clear objectives, support was found as all of the respondents agreed. Support for output control was also found as all stated that the measurability, uncertainty and complexity were not considered as reasons why clear objectives could not be set. In regard to the senior management’s role of NPD, the respondents mostly agreed with the fact that senior management was in charge and disagreed that it would be the departments that were in charge. Finally, all of the respondents agreed that their work was independent. (Appendix 6: red colour)

Behaviour control

Dispersion was found in terms of whether line managers were formally present, as one respondent agreed with the statement, one did not and one stayed neutral (one respondent skipped the question). In regard to whether the line manager set temporary goals and objectives, two agreed. Exactly the same response was found whether or not the line manager was constantly present.
Finally, three (as one stayed neutral) stated that their managers were aware of the different phases of their employees’ work. Three also agreed that their work followed rules (one disagreed) and interestingly three disagreed their work to follow routines (one respondent skipped the question) on the contrary to the Prime case. (Appendix 6: green colour)

*Cultural control*

The average duration of employment was calculated to be 19 years. Three agreed that their line manager was an active and engaged team member (one skipped the question). In terms of employees having being offered internal training in the beginning of their career, three agreed with this statement and one disagreed and in regard to later in their career two agreed, one disagreed and one skipped the question. All of the respondents felt responsibility toward their work as in the Prime case. Respondents were found to be loyal toward their company (all respondents) and toward their colleagues (three respondents, one skipped the question), in line with Prime case. Finally, three of the respondents stated that they participated in team building activities and staff events (one was neutral). (Appendix 6: blue colour)

*Improvement Areas*

In regard to questions about creativity, flexibility and adaptability, one respondent did not answer to it. However, the rest of respondents disagreed that the management diminished the employees’ creativity. Actually, the management was perceived to enhance creativity by two while one remained neutral. In regard to flexibility, one stated that the management diminished flexibility while two answered neutral. Vice versa, when asked if the management increased flexibility, one disagreed and two stayed neutral. Finally, the management was stated to diminish adaptability according to two respondents and one respondent remained neutral. One respondent disagreed with the statement that the management would enhance adaptability while two stayed neutral. This suggests that present management style was considered quite inconclusive as creativity was enhanced according to two respondents and adaptability enhanced by only one respondent. None of the respondents agreed with that the present management style enhanced flexibility. When asked for direct improvement suggestions for innovation and NPD management, two of the respondents stated lack of time to be the biggest obstacle for improvement; two stated also that the company’s process procedures should be clarified. Finally, one of the respondents mentioned also that long-term planning required improvement. These results were in line with the responses from Prime case, as improvement areas were found in terms of receiving more resources and time as well as investing in programs and long-term planning.
<table>
<thead>
<tr>
<th></th>
<th><strong>SIMILARITIES</strong></th>
<th><strong>DISSIMILARITIES</strong></th>
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<tbody>
<tr>
<td><strong>OUTPUT CONTROL</strong></td>
<td>Clear objectives</td>
<td>More time wanted</td>
</tr>
<tr>
<td></td>
<td>Immeasurability not an issue</td>
<td>More long-term planning</td>
</tr>
<tr>
<td></td>
<td>Independent work</td>
<td></td>
</tr>
<tr>
<td><strong>BEHAVIOUR CONTROL</strong></td>
<td>Temporary goals and objectives</td>
<td>No routines</td>
</tr>
<tr>
<td></td>
<td>Line managers constantly present</td>
<td>Clarification of procedures</td>
</tr>
<tr>
<td></td>
<td>Line managers aware of the employees’ work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clear rules</td>
<td></td>
</tr>
<tr>
<td><strong>CULTURAL CONTROL</strong></td>
<td>Responsibility for own work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Line managers active and engaged team members</td>
<td></td>
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<tr>
<td></td>
<td>Loyalty toward colleagues and company</td>
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<tr>
<td></td>
<td>Training provided and valued</td>
<td>Staff events provided and valued</td>
</tr>
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*Figure 6. Minor case findings.*
5 Analysis

5.1 Present Management Style

R&D functions were stated to require other control systems than what traditional control systems can provide (Rockness & Shields 1984). This was empirically shown as 81 percent of the Prime case respondents considered management to differ between R&D units and the other units in the organization. Thus freedom and flexibility are evidently necessary in dynamic settings such as in the R&D and marketing units in the Prime case where employees’ working days were uncertain and irregular. Due to this irregularity and complexity the employees could not be managed in a restrictive manner but only by granting freedom, which has an positive impact on innovative potential (Young & Tavares 2004; Persaud 2005).

Despite the increased flexibility provided for R&D, structure existed in the Prime case’s R&D unit as the employees had agendas in the meetings, were appointed to specific line managers who distributed and guided the employees to cover particular objectives and targets. Further support for existence of structure was found as managers coordinated and followed up the most important milestones (“gates”) which were also seen as influential on NPD and the employees’ innovative behaviour. Simultaneously the employees were granted freedom, hence it is partly supported that innovation requires structure and clear reporting relationships (Jelinek & Schoonhoven 1993). Minor cases confirmed that structure (personal performance targets, goals and follow-up meetings) was regarded as an aid for innovative behaviour even though R&D units were managed less daily guidance.

5.2 Respective Control Mechanisms

5.2.1 Output Control

Formal control systems were expected to be used to a lesser extent than the informal, as the relationship between formal control systems and innovation tasks is contradictory. In line with the characteristics of output control, Prime case goals were clear and complexity or uncertainty was not seen as an issue for measuring the outputs in advance. Interestingly this opposes the statement that it is difficult to assess the potential payoffs of the outcome in advance in R&D settings (Rockness & Shields 1988; Cardinal 2001). Also appraisals were mentioned to be hard to conduct because the senior management lacked the knowledge to evaluate the employees’ performance (Zuckerman & Brajkovich 2003). This was contradictory in the Prime case as senior management was in charge (by controlling the project progress) but as they lacked the sufficient detailed data and direct
involvement, the departments were also perceived to be in charge. Further support for output control was found as the senior management did not interfere with the employees’ independent autonomous work (Chang et al. 2009) by any other means than by setting targets and measuring the performance with the help of financial data and figures from production and sales (Ouchi 1977).

However, the Prime case managers endeavoured the senior management to be more involved. Thus pure reliance on output control is not optimal in this case as it was stated that the senior management’s support makes the company successful. This statement also verified the findings of Zuckerman and Brajkovich (2003) who said that management with targets from the senior management level without local level support was seen as ineffective. Furthermore, even though the interviewees agreed that their work was independent, all the survey respondents from the Prime case did not agree with this as they perceived to be managed in some other manner than solely by stating clear personal goals and objectives. Thus it was shown that R&D work is specialised and done also in small teams (Zuckerman & Brajkowich 2003).

Output control was also found to emphasize incremental projects with more predictable outcomes and faster returns which led R&D professionals to focus on projects’ success and to jeopardize the development of revolutionary knowledge (Cardinal 2001; Poskela & Martinsuo 2009). The respondents from the Prime case considered time to be an issue for their work as it was stated that investing time for creativity and innovation were talked about but hardly implemented in practice: “I have all the tools needed: the databases, Internet, colleagues, trainings provided but what I am missing is time”. Thus more focus on long-term research was suggested as an improvement area in order to reach bigger returns and revolutionary knowledge. In addition, the targets should be reconsidered in collaboration with the employees who execute the innovative tasks and thus the target setters should be more closely involved in the employee’s work. Thus application of solely output control is hardly likely as it was concluded to be suitable in management control of short-term interest (Poskela & Martinsuo 2009).

Additionally, as the Prime case is diversified and internationally decentralized, it could be seen to support Merchant’s (1981) suggestions for using output control as it was stated that this form of control had emerged due to growth in companies. Nevertheless, Prime case’s size can explain why output control is not used exclusively as this is not a large multinational company. Furthermore, decentralization was not considered as beneficial for management of NPD and the employees’ innovative behaviour as collaboration and involvement with other units was suggested.
Interestingly, more support for output control was found from the Minor cases as they stated that senior management was in charge and granted independency. However, also here time was considered to be an issue and was stated to be the biggest object for improvement which diminished the value of output control. Once again in line with Prime case, it was seen that measurability of outputs in advance was not considered to be an issue contrary to the statements provided by the previous literature (Rockness & Shields 1988; Cardinal 2001; Zuckerman & Brajkowich 2003).

As expected, output control’s usage in NPD settings gained support partly as improvement areas were found. All the case companies stated that targets were clearly set and measurability of them in advance was not an issue. In addition, the case companies’ senior management was in charge but not on a detailed level – thus independency and freedom were granted but interestingly only to some extent. In the Minor cases, the senior management was more in charge and more independency was granted. The suitability of output control is questioned as the respondents stated to desire more time, more collaboration with other units of the company and with the senior management. Thus, output control does not explain wholly the current situation.

5.2.2 Behaviour Control

Behaviour control was expected to be used the least as formalization through rules and procedures was said to inhibit creativity and to restrict the capacity to deal with uncertainty effectively (Aiken & Hage 1971; Adler & Borys 1996; Cardinal 2001; Poskela & Martinsuo 2009). However, in line with behaviour control, the Prime case line managers set temporary goals and objectives for the employees. The line managers were also aware of the different phases of the employees’ work. In other words, they were more closely informed and involved (than the senior management) in the transformation process of input into output but not on a very detailed level however. Thus it was analysed in line with Ouchi (1977) that if the line managers do not know fully the transformation process, they cannot rationally control the subordinates by watching and guiding their behaviour. This was shown in the Prime case as the respondents were inconsistent with whether the line managers were constantly present and formal meetings were not held more often than once a week.

As was already mentioned in output control analysis, the employees were granted freedom which minimized the reliance on close personal surveillance and direction of the subordinates. However, the respondents from the Prime case stated that if problems arose the line managers were available. According to one interviewee, the lack of interference was explained by shared agreements that everybody “runs the job”. Interestingly, the frequency of contact was related to the position one held in the company and also to the nature of the projects: even though the meetings seemed to be
occasional, on the management level they were more frequent because project management was perceived to require daily contacts.

In terms of formality, only half of the respondents showed the line managers to be formally present. The interviewees stated that even though meetings had agendas and were planned to some extent, informality existed as the interviewees could “share all their worries and ideas freely”. In addition, informality enabled the subordinates and superiors to help each other and to deliver together “what needs to be done”. However, the employees were monitored with processes, rules and regulations which gave the strongest support for behaviour control (Ouchi 1979; Rockness & Shields 1984) in the Prime case. According to the interviewees, gates and processes were to be followed and a large amount of documents needed to be completed on a daily basis. Furthermore, the line managers’ permission had to be gained in order to proceed to the next phase of a project which was mentioned by Cardinal (2001) as bureaucratic gatekeeping. As also found in output analysis, time and short-term planning were seen as issues that pushed the employees to concentrate their efforts on small improvements to demonstrate productivity for the “gatekeepers” (Cardinal 2001). These bureaucratic gatekeeping settings do not support the creation of revolutionary knowledge and thus behaviour control would “kill creativity” (Poskela & Martinsuo 2009). The respondents supported this by stating that in order to enhance their innovative behaviour, bureaucracy and administrative processes ought to be diminished. Despite these negative implications of behaviour control, closer professional guidance was suggested as a solution to “free up time” and thereby enhance their innovative behaviour. Thus Poskela & Martinsuo’s (2009) positive statement toward behaviour control was supported as aspiration for more enhanced communication and coordination between different actors were perceived to enhance synergies and thereby creativity.

The Minor cases are somewhat in line with the results from the Prime case as it was found that the line managers set temporary goals and objectives for the respondents. Managers were also found to be constantly present but, in terms of formality, the results do not give strong evidence. Interestingly, the Minor cases revealed that their line managers were aware of the different phases of the employees’ work which gave more support to behaviour control than in the Prime case. Finally, their work followed rules but, on the contrary to the Prime case, did not follow any routines. The lack of routines was further mentioned as an improvement area in the Minor case as more clarification of the different programs and processes was desired.

The expectation of behaviour control to have been only thirdly applicable in NPD settings was supported. This was because even though the major characteristics of behaviour control such as
rules and routines as well as temporary goals and objectives were present, there was a lack of formality and the line managers were not fully aware of the different phases of the employees’ work. Interestingly, behaviour control demonstrated the current management style more in Minor cases since the line managers were stated to know fully the different phases of the employees’ work but, however, no routines were found in practice. Finally, even though increased professional guidance was seen as beneficial to the employees’ innovative behaviour, behaviour control was not ideal as it was stated that diminished bureaucracy would have a stronger effect on the innovative behaviour.

5.2.3 Cultural Control

From the analysis of output and behaviour control, it can be concluded that the usage of an informal control mechanism was more appropriate than the formal ones. The targets were not set in accordance with the work requirements as the innovative tasks required more time. Thus a more flexible control mechanism and fine-tuned target setting (senior management’s involvement) was required to meet the characteristics of the R&D tasks. This supported the statement that management control system cannot remain static and formal as work requirements become uncertain and complex (O’Reilly III & Tushman 1997).

In congruence with cultural control characteristics, the average duration of employment in the Prime case was approximately ten years which was firstly analysed to facilitate the existence of a specific organization-wide culture. It was assumed that the Prime case would value this long-term employment as R&D professionals are regarded to possess the critical knowledge in the companies (Jørgensen & Messner 2009). However, the interviewees stated otherwise as they revealed that no long-term benefits existed. Nevertheless, the Prime case attempted to create an organization-wide culture as staff events and trainings were provided in the beginning and later in the careers (which would ideally diminish the turnover rate which was high in the Prime case). In fact, the interviewees stated that despite the educative and idea generating aspects that the events brought along, also team spirit was built and synergies enhanced between the units. All of the respondents were in favour of the trainings as a continuous training approach was seen as highly beneficial and regarded to be at the top of the agenda of human resources.

All respondents stated to feel responsible for their work which supported cultural control as employees’ judgements were valued and they were given autonomy as a token of trust (O’Reilly III & Tushman 1997). Further commitment was found as all felt loyal toward their colleagues and the majority felt loyal toward the company. The successful team spirit building activities and the synergies between the employees’ interactions represented the full loyalty toward the colleagues.
which facilitated the existence of organization-wide culture. The majority of the survey respondents also felt loyal toward the company which questioned the statement that R&D professionals would consider themselves firstly as scientists and only thereafter as a part of an organization (Zuckerman & Brajkovich 2003). In the Prime case, the professional norms did not overrule those of the organization as was the case in Cardinal’s study (2001). Interestingly, the interviewees showed that the higher the position you reached in the company, the more you felt loyal toward it, which opposed Zuckerman & Brajkovich’s (2003) statements.

As already pointed out in the analysis for behaviour control, the level of formality was not high in the Prime case and this was further supported by stating that the line managers were active and engaged team members. This supported the usage of an informal control mechanism since in pure cultural control systems the monitoring occurs through shared agreements and interpersonal interactions (Baliga & Jaeger 1984). As mentioned earlier, the shared agreements and expectations prevailed as interference was minimal and the employees were aware of their roles in the company. The lack of formality and the possibility to always get in touch with the respective line managers facilitated the creation of a social system and increased interplay among different actors in the innovation process. This supported the statement that cultural control is the only way to manage in NPD settings (Pohlmann et al. 2005) which was further verified as the respondents desired an increased amount of cross-team activities as well as synergies between other units in the company. These cross-team activity synergies as well as the rules, procedures and codes (“gates”) mentioned above, created a particular language, rituals (products’ daily tasting sessions) and a set of norms that the employees knew and followed. Finally, practicing cultural control in depth could solve the time issue mentioned in the output control’s improvement areas as cultural control is a timelier manner to monitor (Rockness & Shields 1984).

The findings from Minor cases supported the usage of cultural control strongly as the average duration of employment was almost 20 years. In a similar manner to the Prime case, the line managers were seen as active and engaged team members as well as that they were offered internal training in the beginning and later in their careers, reinforcing the creation of an organizational culture. In addition, all of the respondents felt highly responsible for their work and participated in team building activities and staff events. Interestingly, all felt loyal firstly toward the company and then toward the colleagues. This result confirmed the finding in the Prime case: the higher your position, the more you feel loyal toward the company as all the respondents are R&D directors in the Minor cases.
As it was expected, cultural control was found to be the most appropriate control mechanism to be utilized in NPD and innovative settings. This was because the findings showed that the working environment was highly informal and great importance was placed on the value of team building activities and trainings from both the employees’ and the organizations’ side. Thus an attempt to build and maintain an organization-wide culture, loyalty and internalized values were found in practice (specific language, rituals and codes).

5.3 CONTROL MECHANISMS IN COMBINATION

The separate control mechanisms were useful in explaining the present management styles in the case companies. The usage of cultural control matched expectations as it was used the most but characteristics of the formal control mechanisms coexisted. Thus the analysis supported the fact that R&D settings are dynamic, changing and complex (O’Reilly III & Tushman 1997) and thus the control mechanisms cannot remain unilateral. Cultural control was complemented with formal aspects in terms of setting clear targets and goals, rules and routines as well as temporary goals and objectives. Hardly any company can survive without these formal elements as they represent benefits for the management of NPD and cannot be taken solely as a hindrance to innovation (Davila 2005). For example, the measurability of outputs in advance was not perceived as such a barrier as in the previous research (Rockness & Shields 1988; Cardinal 2001; Zuckerman & Brajkovich 2003). The findings showed also that Prime case had a system that produced reliable and verifiable evidence of the output which is why heavy interference in the activities is not needed (Ouchi 1977). However, output control was not considered as the best solution for handling long-term interest which was also alleged by Poskela and Martinsuo (2009). All in all, the control mechanisms and complex and changing work requirements reflect each other as was the case in O’Reilly III & Tushman’s study (1997). Thus reliance on one particular control mechanism is not enough to create the best practise for NPD management.

As the present management style was not composed of only one control mechanism, it was difficult to draw consistent conclusions about, for instance, creativity inhibiting or enhancing factors that the respective control mechanisms were stated to entail. For example, creativity inhibiting elements from behaviour control such as close personal surveillance were not found because the employees were granted freedom. Thus the combination allowed creativity to bloom which would not have been necessarily possible if solely one control mechanism had been used.

However, the present management style remains as an object for improvement because it was perceived to enhance creativity, flexibility and adaptability according to less than half of the
respondents in the Prime case. In the Minor cases, the present management style was perceived to enhance adaptability according to one fourth and to enhance creativity according to half of the respondents. The present management style was not seen as flexibility enhancing. The suggestions for improvement areas gave further support for a combined usage of the control mechanisms as characteristics of both the informal and formal control mechanisms were found (for instance, increased professional guidance, more time and freedom, long-term planning as well as innovation courses). In conclusion, a dynamic combination of these three control mechanisms created the best practises to balance efficiency and flexibility needed in NPD settings (Cray 1984; Persaud 2005; Jørgensen & Messner 2009).
6 CONCLUSION

In response to the research question about to what extent NPD can be managed with the three control mechanisms, it was determined that they were used more in combination than respectively. The question appeared more complex than originally thought, as none of the control mechanisms were represented in the purest form, which only supported the notion that control mechanisms are complementary and not substitutable (Ouchi 1977; O’Reilly III & Tushman 1997; Harzing 1999). Furthermore, the present study suggests that formal and informal control mechanisms coexist and interact and hence create an interesting “clash” (Bisbe & Otley 2004) in the R&D settings. An informal approach is important as the innovative work cannot be harnessed to full potential if the manager does not know how the innovator is encouraged (Zuckerman & Brajkovich 2003). Thus according to the present findings a more personalized and customized take on innovation encouragement and management is beneficial. In the same vein, Simons (1995) stated that the essential act is not to pick and choose from for example experimentation and efficiency, but to integrate both of them in the organizations. Conclusively, the study supports the initial statement that NPD management is about balancing efficiency and flexibility (Jørgensen & Messner 2009), which requires more creative control. On the basis of the current findings, freedom and autonomy that encourages innovative behaviour (Young & Tavares 2004; Persaud 2005) can be controlled most efficiently with cultural norms which are a more powerful commitment than those created by targets and objectives. However, the revised view of output control (Davila 2005) is supported as the analysis showed that the benefits of using output control are not overruled by its barriers such as the measurability of the outputs in advance.

As a limitation, the present study’s empirical material consisted only of management level observations, which create a different picture of the management style than for example by including employee level observations. Furthermore, it was seen that management control systems are unique as the companies used respective mechanisms in different amounts. Even though some similarities occurred, company related variance existed in R&D management styles. This can explain the magnitude of conclusions in previous research, along with the fact that the definitions and operationalisations of control mechanisms are inconsistent. Companies in this study perceived to be reactive toward innovation, which can also have an impact on the management control system. For example, if a company is more proactive and embraces risks more consciously, the management control system would reflect this. Thus, studying the control mechanism’s informal-formal-combination in organizations and industries that perceive themselves as proactive is proposed for future research.
REFERENCES


**Internet**


Other
Annual report 2009 [Case A]
Annual report 2008 [Case B]
Annual report 2008 [Case C]
Annual report 2009 [Case D]
Company website 2010 [Prime Case]
Company website 2010 [Case A]
Company website 2010 [Case B]
Company website 2010 [Case C]
Company website 2010 [Case D]
Press release 2009 [Prime Case]

Front Picture
## APPENDIX 1

### Case companies’ information

<table>
<thead>
<tr>
<th>COMPANIES</th>
<th>FOUNDED IN</th>
<th>INTERNATIONALITY</th>
<th>STAFF</th>
<th>REVENUE</th>
<th>SPECIALISATION</th>
<th>INNOVATION</th>
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<td><strong>Prime Case</strong></td>
<td>Late 19th century</td>
<td>Operations in 15 countries, sales in &gt;30 countries.</td>
<td>&lt; 5 000</td>
<td>€0.5 billion (2009)</td>
<td>Established brands. Health, wellness, functionality.</td>
<td>Seen as key factor for success: revenue from innovation and NPD grown strongly.</td>
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<td><strong>Case A</strong></td>
<td>Late 19th century</td>
<td>Operations in &lt;10 countries, exports in 15 countries.</td>
<td>&lt; 20 000</td>
<td>€1.5 billion (2009)</td>
<td>Established brands, versatile business areas.</td>
<td>Active in health awareness operations; innovation used to meet the changing nutrition demands.</td>
</tr>
<tr>
<td><strong>Case B</strong></td>
<td>Early 20th century</td>
<td>Operations in 10 countries, exports in &gt;50 countries.</td>
<td>&lt; 5 000</td>
<td>€1.5 billion (2009)</td>
<td>Various business areas, functional food for balanced diet and well-being.</td>
<td>More than 100 products released every year and investment in nutritional and technological innovation. Emphasis on public health problems.</td>
</tr>
<tr>
<td><strong>Case C</strong></td>
<td>Mid 19th century</td>
<td>Operations in &lt;10 countries, exports in 30 countries.</td>
<td>&lt; 5 000</td>
<td>€0.5 billion (2009)</td>
<td>Reinventing themselves and introducing revolutionary products.</td>
<td>Innovative for decades in regard to new tastes and demands. Market leaders and investments to professional expertise and innovative behaviour.</td>
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<tr>
<td><strong>Case D</strong></td>
<td>Early 20th century</td>
<td>Operations in 7 countries.</td>
<td>&gt; 5 000</td>
<td>€1.5 billion (2009)</td>
<td>Emphasis on the importance of knowing purchasing and eating habits.</td>
<td>Continuous development of strategic brands through innovation, new product lines and strong marketing.</td>
</tr>
</tbody>
</table>

Sources: Annual report 2009 [Case A]; Annual report 2008 [Case B]; Annual report 2008 [Case C]; Annual report 2009 [Case D]; Company website 2010 [Prime Case]; Company website 2010 [Case A]; Company website 2010 [Case B]; Company website 2010 [Case C]; Company website 2010 [Case D]; Press release 2009 [Prime Case]
APPENDIX 2

The stages of primary data collection and response rate

<table>
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<tr>
<th></th>
<th>1. PARTICIPATION</th>
<th>2. SURVEYS</th>
<th>3. INTERVIEWS</th>
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<td><strong>PRIME CASE</strong></td>
<td>1 R&amp;D Director</td>
<td>8 R&amp;D Project Managers</td>
<td>3 R&amp;D Managers</td>
</tr>
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<td></td>
<td>1 R&amp;D Manager</td>
<td>4 R&amp;D Managers</td>
<td>2 R&amp;D Directors</td>
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<td></td>
<td>3 Food Legislation Managers</td>
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<td></td>
<td>3 Packaging Technologists</td>
<td>1 R&amp;D Project Manager</td>
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<td></td>
<td></td>
<td>3 Product Developers</td>
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<td></td>
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<td>3 Senior Food Technologists</td>
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<td></td>
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<td>1 R&amp;D Specialist</td>
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<td>1 R&amp;D Director</td>
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<td>4 R&amp;D Directors</td>
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<td><strong>= 30 SURVEYS</strong></td>
<td><strong>= 6 INTERVIEWS</strong></td>
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</table>
APPENDIX 3

Survey Questions

Q.1
Job title and duration of employment

Q.2
How is your work managed by your line manager?
Which style or mechanisms does your line manager use?

Q.3
How does management influence new product development? How does management influence your innovative behavior?

Q.4
To what extent is your line manager

<table>
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<tr>
<th></th>
<th>Not at all</th>
<th>To a small extent</th>
<th>To some extent</th>
<th>To a moderate extent</th>
<th>To a great extent</th>
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<td>An active and engaged team member</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Constantly present</td>
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<tr>
<td>Setting temporary goals and objectives</td>
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Setting final goals and objectives

Q.5
Choose the most appropriate answer

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<td>Senior management’s perception of innovation is proactive</td>
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<td>Senior management’s perception of innovation is market reactive</td>
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<td>Senior management is in charge of new product development</td>
<td></td>
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<td></td>
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</tr>
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<td>Departments are in charge of new product development</td>
<td></td>
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<td>Management of activities varies between different departments (e.g. production, marketing, research and development)</td>
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<td>Management varies between different products (innovative, established products)</td>
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<td>Staff are offered internal training in the beginning</td>
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<td>Staff are offered internal training later during the employment</td>
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Q.6
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<td>I have clear objectives in regard to my assignments</td>
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<td>I do not have clear objectives because performance of my work is hard to measure in advance</td>
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<td>I do not have clear objectives because my innovative work is uncertain</td>
<td></td>
<td></td>
<td></td>
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</table>
I do not have clear objectives because my innovative work is complex

I work independently

My manager knows the different phases of my work

I feel responsible for my work

For my work I follow rules

For my work I follow routines

I feel loyal to my colleagues

I feel loyal to the company

I participate often in team building and staff events

Q.7
To what extent the management of my tasks

<table>
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<th></th>
<th>Not at all</th>
<th>To a small extent</th>
<th>To some extent</th>
<th>To a moderate extent</th>
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<td>Diminishes creativity</td>
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<td></td>
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<td></td>
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<tr>
<td>Enhances creativity</td>
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<td>Diminishes flexibility</td>
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<td>Enhances flexibility</td>
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</tr>
<tr>
<td>Diminishes adaptability in regard to external challenges</td>
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</table>
Q.8

How could the management of new product development be improved? How could the management of innovation be improved?

Which changes/improvements/suggestions would you like to pose?
APPENDIX 4

Interview Guide

UPPSALA
UNIVERSITET

Department of Business Studies
April 2010
Interview Guide - New Product Development Management

1. Duration of employment; does your company value long-term employment (for example do you have some benefits the longer you have been employed)?

2. How does management differ between different departments in the company (for example between marketing, production and R&D)?

3. Which of the following statements you relate to the most?
   a. My manager is a project distributor and delegator who prioritizes and guides my work in order to avoid work overloads.
   b. I am given responsibilities and freedom for my work.
   c. My manager maintains open and honest communication and builds trust.

4. Which of the following statements you relate to the most?
   a. My manager encourages my innovative behavior tremendously.
   b. For all the projects, I have to gain my manager’s approval in order to proceed.
   c. My manager coordinates only clear targets for me and does not participate in the creation process.

5. How is your innovative behavior encouraged? What forms of encouragement are used?
   a. Targets are given but I receive total freedom to achieve them.
   b. Encouragement takes place daily as smaller targets are set which need to be achieved on a regular basis.
   c. Encouragement takes place daily, as I am encouraged to engage and contribute to the working environment that emphasizes innovative behavior.

6. Describe briefly one regular working day. Or is your work highly complex and uncertain, “regularity” does not exist?

7. How closely involved is the senior management in your work?
8. How well does the senior management know the different phases and procedures of your work?

9. How well does your line manager know the different phases and procedures of your work?

10. Do you work mostly independently or in some other form?

11. How often do you meet with your line manager? What is the meeting like?

12. Are internal trainings and staff events only obligatory events or do you see positive aspects in them?

13. Do you feel more loyal toward your colleagues or to the company?

14. In order to increase your creativity, which of the following options you perceive as most relevant?
   a. Increased freedom.
   b. Increased professional guidance.
   c. Increased number of “innovation courses”, training, brainstorming and creative events.
   d. Other.

15. In order to increase the flexibility and adaptability of your work, which of the following options you perceive as most relevant?
   a. Increased freedom.
   b. Increased professional guidance.
   c. Increased number of “innovation courses”, training, brainstorming and creative events.
   d. Other.
APPENDIX 5

Prime Case raw data findings

Question 4. To what extent is your line manager

<table>
<thead>
<tr>
<th></th>
<th>NOT AT ALL</th>
<th>TO A SMALL EXTENT</th>
<th>TO SOME EXTENT</th>
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<td>24%</td>
<td>24%</td>
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Question 5. Choose the most appropriate answer

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<td>Management of activities varies between different products (innovative, established products)</td>
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Question 6. Choose the most appropriate answer

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<td>26.92%</td>
<td>79.08%</td>
</tr>
<tr>
<td>For my work I follow rules</td>
<td>0%</td>
<td>3.85%</td>
<td>15.38%</td>
<td>57.69%</td>
<td>26.92%</td>
</tr>
<tr>
<td>For my work I follow routines</td>
<td>0%</td>
<td>0%</td>
<td>3.85%</td>
<td>34.62%</td>
<td>65.38%</td>
</tr>
<tr>
<td>I feel loyal to my colleagues</td>
<td>0%</td>
<td>0%</td>
<td>7.69%</td>
<td>53.85%</td>
<td>38.45%</td>
</tr>
<tr>
<td>I feel loyal to the company</td>
<td>0%</td>
<td>0%</td>
<td>24%</td>
<td>64%</td>
<td>12%</td>
</tr>
<tr>
<td>I participate often in team building and staff events</td>
<td>0%</td>
<td>0%</td>
<td>24%</td>
<td>64%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Question 7. To what extent the management of my tasks

<table>
<thead>
<tr>
<th></th>
<th>NOT AT ALL</th>
<th>TO A SMALL EXTENT</th>
<th>TO SOME EXTENT</th>
<th>TO A MODERATE EXTENT</th>
<th>TO A GREAT EXTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diminishes creativity</td>
<td>12%</td>
<td>32%</td>
<td>22%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Enhances creativity</td>
<td>3.85%</td>
<td>30.77%</td>
<td>23.08%</td>
<td>34.62%</td>
<td>7.69%</td>
</tr>
<tr>
<td>Diminishes flexibility</td>
<td>23.08%</td>
<td>39.23%</td>
<td>42.31%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Enhances flexibility</td>
<td>3.85%</td>
<td>23.08%</td>
<td>30.77%</td>
<td>30.77%</td>
<td>11.54%</td>
</tr>
<tr>
<td>Diminishes adaptability in regards external challenges</td>
<td>21.74%</td>
<td>26.09%</td>
<td>34.79%</td>
<td>13.04%</td>
<td>4.35%</td>
</tr>
<tr>
<td>Enhances adaptability in regards external challenges</td>
<td>16.67%</td>
<td>16.67%</td>
<td>25%</td>
<td>37.5%</td>
<td>4.17%</td>
</tr>
</tbody>
</table>
APPENDIX 6

Minor Case raw data findings

Question 4. To what extent is your line manager

<table>
<thead>
<tr>
<th>To what extent</th>
<th>Not at all</th>
<th>To a small extent</th>
<th>To some extent</th>
<th>To a moderate extent</th>
<th>To a great extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formally present</td>
<td>0%</td>
<td>33.33%</td>
<td>33.33%</td>
<td>0%</td>
<td>33.33%</td>
</tr>
<tr>
<td>An active and engaged team member</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>66.67%</td>
<td>33.33%</td>
</tr>
<tr>
<td>Constantly present</td>
<td>0%</td>
<td>0%</td>
<td>33.33%</td>
<td>66.67%</td>
<td>0%</td>
</tr>
<tr>
<td>Setting temporary goals and objectives</td>
<td>0%</td>
<td>0%</td>
<td>33.33%</td>
<td>66.67%</td>
<td>0%</td>
</tr>
<tr>
<td>Setting final goals and objectives</td>
<td>0%</td>
<td>0%</td>
<td>33.33%</td>
<td>33.33%</td>
<td>33.33%</td>
</tr>
</tbody>
</table>

Question 5. Choose the most appropriate answer

<table>
<thead>
<tr>
<th>Perception of innovation</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior management's perception of innovation is proactive</td>
<td>0%</td>
<td>0%</td>
<td>25%</td>
<td>75%</td>
<td>0%</td>
</tr>
<tr>
<td>Senior management's perception of innovation is market reactive</td>
<td>0%</td>
<td>25%</td>
<td>0%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>Senior management is in charge of new product development</td>
<td>0%</td>
<td>25%</td>
<td>25%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Departments are in charge of new product development</td>
<td>25%</td>
<td>75%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Management of activities varies between different departments (e.g. production, marketing, research and development)</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Management varies between different products (innovative, established products)</td>
<td>0%</td>
<td>0%</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Staff are offered internal training in the beginning</td>
<td>0%</td>
<td>25%</td>
<td>0%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>Staff are offered internal training during the employment</td>
<td>0%</td>
<td>33.33%</td>
<td>0%</td>
<td>66.67%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Question 6. Choose the most appropriate answer

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have clear objectives in regards my assignments</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>50%</td>
<td>5%</td>
</tr>
<tr>
<td>I do not have clear objectives because performance of my work is hard to measure in advance</td>
<td>25%</td>
<td>75%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>I do not have clear objectives because my innovative work is uncertain</td>
<td>66.67%</td>
<td>33.33%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>I do not have clear objectives because my innovative work is complex</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>I work independently</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>My line manager knows the different phases of my work</td>
<td>0%</td>
<td>0%</td>
<td>25%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>I feel responsible for my work</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>For my work I follow rules</td>
<td>0%</td>
<td>25%</td>
<td>0%</td>
<td>75%</td>
<td>0%</td>
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<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>I feel loyal to my colleagues</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>33.33%</td>
<td>66.67%</td>
</tr>
<tr>
<td>I feel loyal to the company</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>I participate often in team building and staff events</td>
<td>0%</td>
<td>0%</td>
<td>25%</td>
<td>25%</td>
<td>50%</td>
</tr>
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</table>

Question 7. To what extent the management of my tasks

<table>
<thead>
<tr>
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<tr>
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<td>0%</td>
<td>0%</td>
</tr>
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<td>66.67%</td>
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</tr>
<tr>
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<td>66.67%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
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<td>33.33%</td>
<td>66.67%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Diminishes adaptability in regards external changes</td>
<td>0%</td>
<td>66.67%</td>
<td>33.33%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
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<td>33.33%</td>
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</tr>
</tbody>
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