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Fostering Creativity in New Product Development Teams

Exploring the Impact of Control Systems on Individual Creativity

Master Thesis General Management

Title: **Fostering Creativity in New Product Development Teams:** Exploring the Impact of Control Systems impact on Individual Creativity

Authors: Walid Yousef and Jesper Lindberg

Tutor: Tomasso Minola

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Abstract

New product development is crucial for companies to remain strong and competitive in the market. Many companies today have implemented systems for controlling and managing their new product development. These control systems can be structured in a formal way with clear steps and criteria throughout the projects or in a more open-ended way where the projects follow a fuzzy front-end approach. Decision making is an immense factor in the control systems and the execution varies depending on its structure. The purpose with this thesis is to investigate the impact of which the structure of formal control systems as decision making tools, has on the creativity of members in new product development teams. Also, to explore which types of leadership behaviors in managers that best structure the formal control system for it to foster individual creativity. To fulfil this purpose, studies on how individuals perceive their work environment and their ability to be a part of the processes have been done.

This qualitative study was conducted by first building a theoretical framework which provided the research question, *"How does the structure of formal control systems affect the creativity in individuals working in NPD teams?".* Data collection was done in a Swedish context using multiple case studies at various sized companies in diverse industries. Primarily through semi-structured interviews which then was followed up by secondary data. The collected data have been analysed by using a cross-case analysis where the identified themes developed an understanding that helped answer the research question. The findings provide value in the field with new insights in the management of innovation and new product development.

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1   Introduction

To introduce the reader to the topic of this study, this first chapter will start with a presentation of the background and then move on to the relevance and the reason for this study to be undertaken in the problem definition. The research purpose and the research questions that we aim to answer are stated in this chapter.

1.1   Background

New product development process is one of the most crucial steps for organisations, it allows the companies to remain strong and competitive in the market (Talke, & Strecker, 2008) by creating and developing products or services that meets the customer's needs and satisfaction (Kazimierska & Grebosz-Krawczyk, 2017). NPD (abbreviation for new product development) is essential for firms because of the increased number of competitors and the changes taking place in the market. It is also essential for firms from an economic sustainability perspective by developing the products life cycles and reduce the production cost (Griffin, 1997). There are two types of NPD innovations, discontinuous- and continuous innovations. The different types of innovations are crucial for the firms growth and position in the market (Veryzer, 1998).

Innovations is usually described as the creation of ideas, products, services and processes. The innovations and ideas can be divided in two groups, continuous innovations and discontinuous innovations. In the article of Veryzer *Discontinuous innovation and the New Product Development process* the two types are describe as: the evolutionary innovations and revolutionary innovations. Continuous innovations are seen as the safe and evolutionary innovations that are building on the origin of the products, services and processes while discontinuous are mentioned as the revolutionary innovations that are seen as the risky innovations and is not developed based on the origin of the products, services or processes (Veryzer, 1998). Discontinuous innovations also known as radical innovations, are those innovations that could create a turbulence in the market as an advantage. These discontinuous ideas often come from individuals within the firm and is later developed in the team. These games-changing products could create a huge market advantages, growth in profit, and become helps the firm to be more competitive comparing to the competitors. Even though there are many huge benefits with discontinuous innovations, many managers

are skeptical to invest and develop the radical innovations, as they are too risky. Discontinuous innovations tend to be voted down because of various reasons, one reason is that, traditional managers find monitoring and control particularly important (McDermott & O'Connor, 2002). The manager's and the leader's decisions are crucial if the discontinuous innovations are developed and is to be pursued.

The decision-making deals with the future of the innovations and their projects, how to develop the innovations during the project execution. The decisions that are chosen in the beginning of the development process takes place to investigate if an innovation and project is out of interest, as the decision-making involves strategic decision tactics to assign resources for the projects. The allocation of resources is a sensitive area for managers and leaders because in many cases resources are limited. Therefore, it is important that the projects are well evaluated before the decision making takes place (Martinsuo & Poskela, 2011). The decision-making process differs from firm to firm, but a formal control system from the upper management is something most firms have in common.
The formal control system is a way to control the development of innovations and products. It is also a way to reduce initiating overly risky projects that risks failing and the company's resources that have been used during the projects are most likely to have been used unnecessarily (Schultz, Salomo, de Brentani, & Kleinschmidt, 2013).

Stage gate systems is one example of a model to reduce the number of risky projects by having gates during the projects that evaluates the projects status in its current stage, and if any changes or limitations should be assigned to the project to minimize potential future risks (Cooper, 2008). The formal control may affect the creativity of generating discontinuous innovations and letting them to develop in a risky but profitable way, formal control systems may also affect the design engineers and product developer's creative ability to generate and develop new discontinuous ideas.

1.2   Problem Definition

Organizational performance relies on product innovation and development. Performance in relation to an organizations innovation and whether it is driven by individuals or by process has been debated in previous publications. Conservative views point out that a highly structured process for innovation in firms are associated with positive firm performance (Mollick, 2012). There is research which debates that the use of highly

structured control systems can have a negative effect on the opportunities to develop radical ideas which can harm the creativity in individuals within NPD teams (Martinsuo & Poskela, 2011)

Research on how formal control systems affect NPD in organizations implies that it provides structure and efficiency to innovation management and that having a control system in play is positive for NPD and decisions making system. Earlier studies also state that formal control systems can improve NPD performance in some cases, while reducing it in other (Schultz et al., 2013). This lead to the insight that there is a problem for managers in organizations how to know when to implement formal control to support continuous innovation and when to support discontinuous innovation by bypassing the implemented control system. By looking at the effect of the design of formal control systems, this study will also investigate which leadership behavior that is most likely to support changes in NPD processes. Leadership is among the most important factors facilitating innovation and one factor for this is internal support for innovation, which states that the work environment is created to emphasize creativity (Gumusluoglu & Ilsev, 2009).

Most research in the field studies the impact of formal control on innovation performance and leader's abilities to foster the creativity and motivation in individuals working in NPD. We have identified a gap between these two views on innovation performance and want to provide answers to how the structure of formal control systems affects the creativity and motivation in the individuals working in NPD teams. Study how highly structured or more flexible control systems as decision making tools impacts the firm's innovation performance. Only some research provides good insight in how employees are able to be creative and the work environment which prevails for NPD are connected. Our aim with this study is to provide an understanding in this subject that can help organizations to further develop their strategies for NPD.

1.3   Purpose

As described above, formal control systems can have both a positive and a negative impact on an organizations innovation performance. The two outlined topics in the problem definition brings us to the purpose statement of this study:

The purpose with this study is to investigate the impact of which the structure of formal control systems as decision making tools, has on the creativity of team members in new product development teams. Also, to explore which types of leadership behaviors in managers that best structure the formal control system for it to foster individual creativity.

This thesis will address the following research question in order to fulfill the purpose of the study:

RQ1. How does the structure of formal control systems affect the creativity in individuals working in NPD teams?

The subject of the study requires data to be collected through observations of real time processes to be able to provide a solid research of how organizations currently are dealing with this problem. Therefore, to answer the research question and fulfill the purpose, the study will be qualitative. This thesis will be in line with future research suggested by (Martinsuo & Poskela, 2011) (Kester, Griffin, Hultink, & Lauche, 2011) (Amabile, Schatzel, Moneta, & Kramer, 2004; Gumusluoglu & Ilsev, 2009)

The introduction chapter described the background for this study followed by a description of the problem and purpose which provides a good foundation for this study to be undertaken. Before presenting the theoretical background in the next chapter, a brief explanation of the scope and delimitations for the study will follow.

1.4   Scope and Delimitations

The thesis is written in the field of General Management and examines what opportunities managers in NPD have to make changes in the process of organizations formal control systems, and whether this has an impact on the team members creativity, ability and willingness to innovate. The main focus of this study is to understand the impact of formal control systems and will therefore only study companies who has implemented some sort of system in their processes for NPD, in order to narrow down the field of study. Due to time constraints, the study is delimited to companies in Sweden. Whilst crafting the theoretical framework, we only considered articles published in peer-reviewed journals that are published after the year 1995. This delimitation is done to ensure quality in the research

and to take consideration to the literatures authorship and timeliness. References with earlier publication dates are to be considered for other chapters in this thesis.

2 Theoretical Framework

This chapter includes the frame of reference used to present and analyse theories which we will compare to our empirical findings in order to answer the research questions. Here we also review the current state of the research in the field of study. First, we give a brief introduction then present the themes addressing our topic. Lastly, we will combine our findings and provide a summary.

2.1 Introduction to Theoretical Framework

The literature review is conducted in a systematic literature review approach. The systematic literature review was chosen due to the broad research topic. In order to investigate with a broader range and only investigate peer reviewed articles, the literature review and the view of the topic ensures transparency and fairness (Easterby-Smith, 2015). In order to collect the articles in a systematic approach three main journals was chosen from the ABS list, Innovation management, Strategic Management and Leadership Quarterly thereafter, eight key words within the topic where selected. The academic articles where collected from the database Web of Science.

The literature review will follow a funnel approach where we address the topic through themes that are linked to each other and from which a summary can tie the themes together to bring us clarity about this specific topic in the field of the study. First, we outline the importance of creativity in NPD which is followed by a review on discontinuous and continuous innovation and how they can impact the innovation in organizations, then we investigate which leadership behaviors that is connected to these strategies for innovation and how they are able to foster creativity in team members of NPD teams. These insights are valuable in order to address the theme of formal control systems in NPD and how the structure of these effects the creativity in individuals. The frame of reference will include literature from journals of three various categories to be able to address the topic from several points of view. The relevant theories and concepts presented in the literature will then be intertwined into a summary discussing the findings that will lay ground for our empirical study.

2.2 Importance of New Product Development

New product development is essential for firms and organizations performance, gaining a strong market position and being able to be competitive among their competitors (de Brentani, 2001). New product development is also a way to strengthen a firms connection to its customers by developing new and existing products that fulfil the needs and satisfaction of the customers (Bailetti & Litva, 1995). The importance of continuously developing new and existing products is seen as a critical step in product development, by continuously developing the products with both functional innovations and design innovations (Talke, Salomo, Wieringa, & Lutz, 2009).

The new product development process is continuously developing from when it was on an individual based level, to teams that worked with new product development to increase the performance by combining knowledge and creativity to generate innovations. It has also developed from a structural planning and execution to a more flexible where the different phases are overlapping in a more iterative process (Veryzer, 1998), which also could be referred to as a fuzzy front end. This has been shown to be a more creative approach that leads to generating more discontinuous innovations (Reid & de Brentani, 2004).

The importance of being first with an innovation, how fast it should come to market and when it should be launched is three crucial guidelines that need to be considering while developing new products and launching them. By being the first firm in the market with developed products, firms and organizations provides an indication to their customers that they offer products and services that their competitors cannot do (Lambert & Slater, 1999). Although it is proved to be beneficial to be innovative and bring developed innovations to the market in order remain competitive and maintain their market leading position.

2.2.1 Discontinuous- and Continuous Innovation

Discontinuous and continuous innovations, also known as radical and incremental innovations are the two categories that innovations usually are divided in. The different types of the innovation are both essential for the future of the organizations competitive capabilities in their own way. It is the most radical innovations, discontinuous innovations, are seen as revolutionary and usually leads to the organizations growth which makes them more profitable and gaining stronger market position by developing game changing innovations for the market (Veryzer, 1998). The incremental, continuous innovations are the

evolutionary innovations that are building on developing existing products or making minor development in processes or services. But they are usually not innovations that are seen as breakthroughs (de Brentani, 2001).

The development of the radical discontinuous innovations are usually not through structural and formal processes (Veryzer, 1998), it is most likely that new product development processes are done through an iterative and interactive approach. By combining the development phases and continuously jump from phase to phase through which could be described as a fuzzy front end approach (Reid & de Brentani, 2004). The processes for generating innovations and developing them, is as mentioned in the background, not an individual based strategy. It is done through innovation teams where the knowledge and creativity are combined and in project teams is a leader required to supervise the team and help them generate innovative ideas. It is done through innovation teams where the knowledge and creativity are combined and in project-teams were a leader required to supervise the team and help them generate and develop innovative ideas.

2.3 Leadership Behaviors that Fosters Creativity

In the article of Gumusluoglu & Ilsev: *Transformational leadership and organizational innovation: The roles of internal and external support for innovation* it is stated that "Innovation through creativity is essential for the success and competitive advantages of organizations" (Gumusluoglu & Ilsev, 2009). Strategic leadership has a positive influence on an organizations innovation and strategic leaders has an ability to impact the innovation processes (Elenkov, Judge, & Wright, 2005), who also states that leader's behavior and their relationship to the employees are associated with improved creativity. For members of innovation teams to be able to be creative the aspect of their individual capabilities is not enough, they must also perceive a work environment where they have support from their leader.

A resource-based commitment where team members are confident that their efforts will be rewarded even if it results in failure is needed to foster motivation in the individuals working in NPD teams. Leaders behavior is shown to have a massive influence on the performance of the employees (Amabile et al., 2004; Edmondson & Nembhard, 2009). Whilst the individuals are central for the success or failure of an organization, the importance of a leader that are able to establish a work environment which highlights individual performance are

crucial. In strategic leadership there are two types of leadership behaviors that can be distinguished, transactional leadership and transformational leadership (Gumusluoglu & Ilsev, 2009).

2.3.1   Transactional Leadership

Transactional leadership behavior is based on contingent reward for subordinates who abide by their expected role. Primarily, transactional leadership behavior is focused on task accomplishment. This behavior also reflects on exchange relationships (Burke et al., 2006). Through contingent reward, followers understand what they need to accomplish in order to get rewarded for their effort. Transactional leadership also assists the progress of continuous improvement of current knowledge (Jansen, Vera, & Crossan, 2009). Except the continent reward behavior, management by exception behavior and laissez faire behavior are aspects that transactional behavior is based upon. The prior one is a behavior described by a leader's capacity to not take any actions at all times. Management by exception behavior is when the leader takes action against the subordinate if the expectations are not met (Elenkov et al., 2005). The article of Jung, Wu and Chow: *Towards understanding the direct and indirect effects of CEO's transformational leadership on firm innovation* provides research that transactional leadership can harm creativity and that transformational leadership behavior yields higher motivation for employees to reach their goals and a higher satisfaction for the work environment than transactional leadership (Jung, Wu, & Chow, 2008).

2.3.2   Transformational Leadership

Leaders with transformational behavior has shown to have the ability to raise the follower's performance expectations and to transform their follower's principals and their perception of themselves for them to reach higher levels of ambition and goals. Research also indicates that transformational leadership is substantially positive for innovation (Gumusluoglu & Ilsev, 2009). Transformational leadership behavior can be divided into five components: Charisma, idealized influence, inspirational motivation, intellectual stimulation and individualized consideration. Charisma and idealized influence is about acting as a role model for the follower because they seek to identify themselves with charismatic leaders. Leaders with ideal influence often seek to place their followers needs over their own. Inspirational motivation is an attribute where the leader inspires followers by providing meaning and challenge to their work. They also provide clear expectations for the future. Intellectual stimulation supports followers in their effort to be creative and do not criticize individuals

for their mistakes. Leaders encourage followers to reframe problems and to approach them in new ways. Lastly, leaders exhibit individual consideration by paying attention to their follower's personal needs for achievement and growth while providing them with support by acting as a coach. Transformational leader behavior increases subordinates confidence and self-esteem (Jung et al., 2008).

2.4   Formal Control System

Selecting which ideas, concepts and projects for an organization to implement requires proper evaluation. Poor decisions can result in negative effects of a firm's market position. (Martinsuo & Poskela, 2011). Systems for innovation management has been proved to introduce discipline and efficiency to NPD management. Systems make sure that an organizations projects are constantly updated and revised. Decision are made about kill, accelerate or deprioritize existing projects, evaluation, selection and prioritization of new projects (Cooper, Edgett, & Kleinschmidt, 1999). Having a formal control system in play helps organisations to make termination decisions of which ideas or projects that are no longer in line with firm strategy or which are not expected to generate sufficient profits (Kester et al., 2011). Systems which includes gate meetings has shown to have positive effects regarding efficiency and effectiveness in innovation (Schultz et al., 2013). Gate meetings or gates is where go/kill decisions are made. The gates include quality-checking, decision making and is where points for the next stage is agreed upon. The gate meeting structure consists of deliverables that the team brings to the meeting, criteria for judging the project and output which is a go or kill decision for the project (Cooper, 2008).

Research presents that most firms working with NPD indicates that they use some kind of structured process for innovation management (Barczak, Griffin, & Kahn, 2009). A recognized model for structured processes in innovation management is the Stage Gate. What characterizes these structured processes is that they introduce discipline and efficiency by including gate meetings where decisions regarding which project or ideas to terminate or to proceed developing are made with consideration to several evaluation criteria's (Biazzo, 2009). Termination decision are made by the control system whilst the structure of the control system is decided upon by the top management. Most of the formal control systems focuses on being in line with organizational strategy rather than on discontinuous innovation and expanding into new areas (Barczak et al., 2009).

Firms which has succeeded in NPD have managers that supports the innovation with necessary resources. The structuring of the control system depends on manager attributes and which leadership behavior they possess. Three management styles in structuring the decision making in formal control processes can be distinguished. Evidence-based decisions which means that the decisions are made after proper evaluation and is grounded on solid evidence. Opinion-based decisions where the decisions rely on managerial intuition and the person holding the power makes the final decision. Lastly, power-based decision which is related to organizational politics and decisions is made by dominating individuals and sometimes occur before the gate meetings take place (Kester et al., 2011).
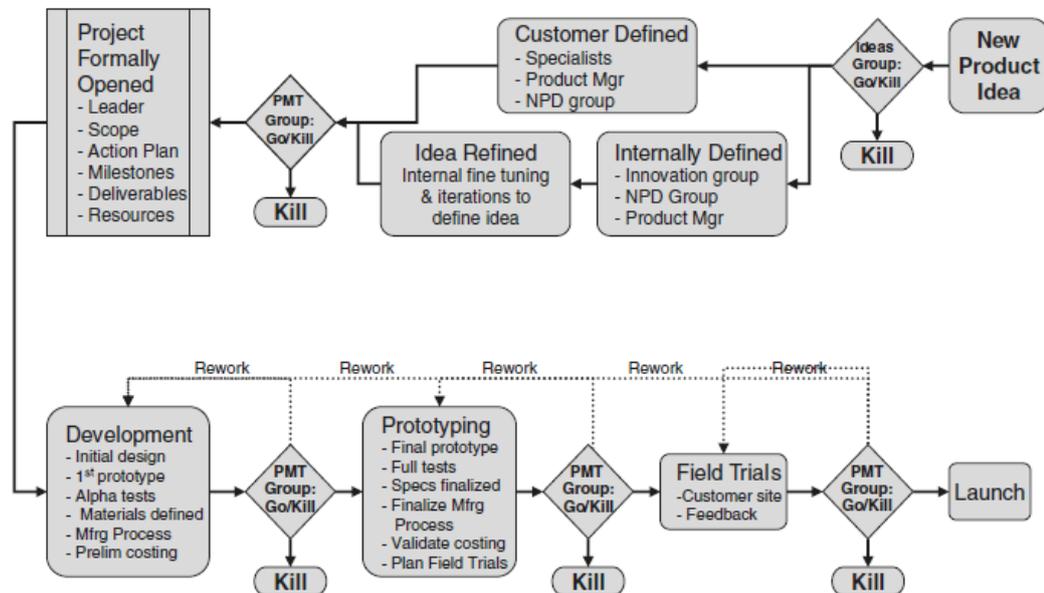

Figure 1, shows an example of a process chart for New Product Development Process.

Source: (Cooper, 2008)

Stage-Gate®: A five stage, five-gate system along with Discovery and Post-Launch Review

Stage-Gate® is a trademark of Product Development Institute
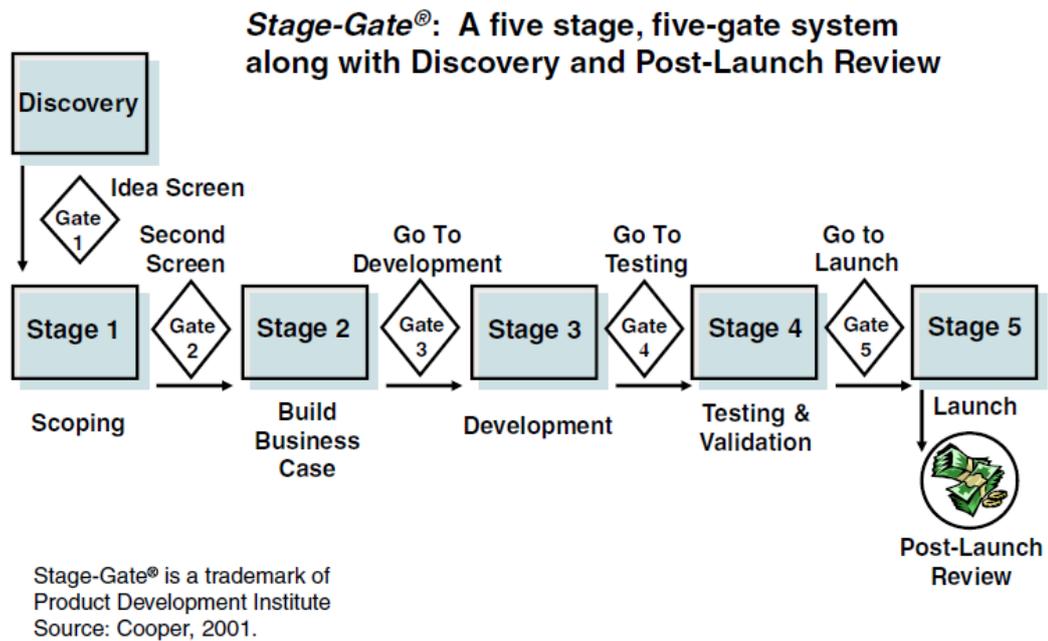Source: Cooper, 2001.

Figure 2, shows the process chart for the Stage Gate model.

Source: (Cooper, 2008)

2.4.1 Formal Control Systems Impact on creativity

Research show that organizations are highly relying on formal control systems and standardized processes to ensure efficiency, but the use of these formal control systems has been debated because of its harmful effects on radical ideas and creativity (Martinsuo & Poskela, 2011; Zhou & George, 2003). Implementing different formal control systems is positive for NPD and its decision making, although research presents that highly structured systems has a negative effect on NPD if not allowing radical innovations, because it can lead to organisational rigidity (Schultz et al., 2013). Individuals working in NPD teams have the ability to get emotionally attached to their ideas and are then reluctant to terminate them even though there are evidence that shows that it is not going to be successful. Individuals working in NPD needs to perceive a supportive work environment in order to produce creative ideas. A supportive work environment where they can produce more innovative and radical ideas and not only focus on short-time profits (Amabile et al., 2004). Leaders who establish a creative work environment and decides upon the decision-making criteria in an organizations formal control system has a direct impact on the creativity in the employees (Gumusluoglu & Ilsev, 2009). Research shows that an informal and a conversational way of evaluation is essential to enable creativity and includes different points of view (Martinsuo &
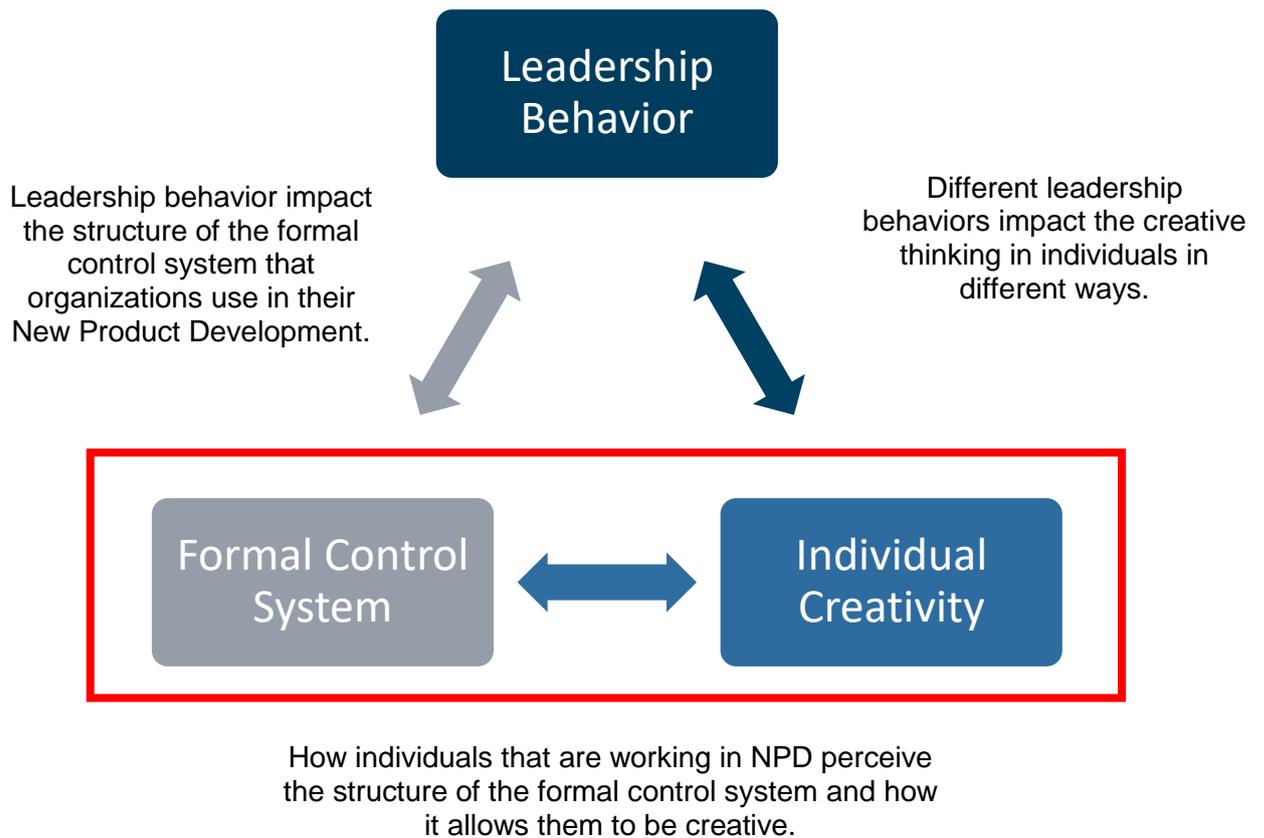
Poskela, 2011). Even though formal control systems have been implemented in many firms, decision making is a very political- and champion-based activity (Barczak et al., 2009). Opinion-based decisions, when the person holding the power makes the final decision grounded on intuition and power-based decision where decisions are pre-determined outside the gate meetings can both have harmful effects on employees innovative and creative mindset. Evidence-based decisions, when decisions are made after proper evaluation has shown to have positive effects on creativity in individuals working in NPD (Kester et al., 2011).

2.5   Summary

The main discussion in this chapter has been about how the managerial behavior impacts the structuring of the formal control system. Different structures depend on which types of innovation the manager support. This is followed by a discussion about how the individuals who is working in NPD teams then perceive the formal control system structure and how it allows them to be creative.

Transformational leaders have shown to be more open towards discontinuous innovation and more able to foster the innovative and creative mindset in their followers than transactional leader. Transactional leadership behavior can be harmful towards creativity and open thinking because of its focus on reward for exceptions while transformational leadership creates a more open and forgiving work environment where individuals feels that all their efforts are rewarded.

The literature also showed that for individuals to be creative and want to produce more risky ideas, managers have to support them with the necessary resources. Leadership behaviors that are more open towards radical or discontinuous innovation are more likely to allow a flexible and open-ended structure for the formal control system because they approve for a conversational approach which includes the employees.

Leadership Behavior

Leadership behavior impact the structure of the formal control system that organizations use in their New Product Development.

Different leadership behaviors impact the creative thinking in individuals in different ways.

Formal Control System

Individual Creativity

How individuals that are working in NPD perceive the structure of the formal control system and how it allows them to be creative.

Figure 3, is a framework which explains the relationships between the main factors that are included in the research. The marked area demonstrates the relationship that are being investigated in this thesis.

The theoretical framework gave rise to the research question which was presented in the purpose chapter. Earlier research has been conducted about the relation between leadership behaviour and creativity in individuals working in NPD and the relation between leadership behavior and formal control systems, but the reviewed literature in this research has generated an understanding that little research has been done about the relations between the structure of formal control systems in NPD and the creativity in the individuals that are working in NPD teams. The relationships are demonstrated in the figure 3 above. This understanding of the field led to the research question: *How does the design of formal control systems affect the creativity in members of NPD teams?*

3   Methodology

Chapter three presents an overview of the research design and the approach. In this chapter, the research philosophy will be described, what methods that are suitable for this topic and a motivation for the method that was chosen for collecting and analysing the data in this research. This chapter will also present the quality aspects in terms of credibility, dependability and trustworthiness. Because of this sensitive research topic, ethical considerations are crucial and will be presented in the end of this chapter.

3.1   Research Design

Research design describes how the research is organized and which activities are taking place during the study (Easterby-Smith, 2015). The importance of designing the research is essential in order to clarify the layout of the research, the choices of methods and the philosophical assumptions of the research. The research design can be described as a project plan or a thread that is used as a guide to achieve the aim of the research (Eriksson, 2008).

In the previous chapters, an introduction to this topic and the theoretical framework within this topic has been presented. The introduction and theoretical framework are the two first steps that has been taking place in this research and its design. The next steps in the research design will be presented through a five-step process. Each step in the process will be described in-dept and the importance of them later in this chapter.

Figure 4, Research design presented in a five-step process.

3.1.1   Research Philosophy

Research philosophy is a about the relationship between epistemology and ontology, it plays a key role in the designing the research as it influences the aim of the study. By presenting the research philosophy of the study and its function, the readers will get a clearer insight into the choice of research methods, models and how the data has been collected and

analysed during the research (Eriksson, 2008). The relationship between epistemology and ontology could described as the relationship between how things work and why things work as they do. Epistemology explains why things work as they do, and is divided in two categories, positivism and constructions. Positivism is the category that measures things from objective methods, while constructionism is measured through subjective methods (Easterby-Smith, 2015). The epistemology of the research affects the aim, purpose, methods and delimitations of the study (Kelly, Chen, & Prothero, 2000), therefore it is important for the researchers to identify their position and how they understand the world, whether it is through a positivist- or constructionist approach.

The aim of this study is to understand how formal control systems affects the creativity in new product development teams on an individual level. In order to investigate how the creativity is affected on an <u>individual</u> level, the most suitable category of epistemology, constructionism is used. In order to argue for the selection of epistemology has table 3.4 from the book: Management and business research written by Easterby-Smith been analysed. The table shows the contrasting implications of positivism and constructionism. The table presented by Easterby-Smith argues for that a construction approach is a more suitable approach while working when the observers is being part of what is being investigated, when the aim is to obtain a general understanding of the situation, when investigating the perspectives of individuals and when we are working with a small cases chosen for a specific reason (Easterby-Smith, 2015)..

Several points from indicates that a constructionist approach is more suitable approach in order to understand how the formal control systems affects the creativity for the individuals in NPD. Through the constructionistic approach can subjective data be collected from each case and then be analysed which will lead to that an understanding is being built about how the creativity of individuals in NPD teams is affected by formal control systems.

3.1.2   Research Methods and Techniques

In general, there are three methods to conduct a research, it could be done through a qualitative, quantitative or a mixed methods which is a combination of qualitative and quantitative methods (Easterby-Smith, 2015). A qualitative study investigates a phenomenon which affects the reality of individuals, teams or organizations (Mills & Birks, 2014). The data collection is mostly primary data and is divided in different cases where the data is collected

through interviews and observations. By collecting data through this approach, the data can be analysed in-dept and contribute to a deeper understanding in the subject in order to answer the research question (Bluhm, Harman, Lee, & Mitchell, 2011).

A quantitative is used to investigate phenomena and the relationship between different variables. The data that is collected is analysed through mathematical tools which provides the research with objective information (Muijs, 2004). The methods are all suitable in their own way, the selection depends on what the objectives of the research is, are the researchers investigating a phenomenon that affects the reality of individuals or the relationship between different variables.

The aim of this study is to investigate how formal control systems affects the creativity of individuals in NPD, therefore the qualitative method has been selected to this research. There are several different way to conduct a study with a qualitative approach, it could be done through a grounded theory, case studies, narrative methods, ethnography or action research (Easterby-Smith, 2015). The outcome of a grounded theory is generating a new theory which is not a suitable approach in order to achieve the objectives of this research (Eriksson, 2008). The action research and ethnography are approaches that requires observation during a longer period. By collecting data through observations, the researchers can obtain information that could not be collected by other means. There is also a risk that what is observed does not behave naturally because of the presence of the observer (Easterby-Smith, 2015). An ethnography or an action research could be suitable for this topic and if this research would last for a long period. An NPD process is not a short-lived process, it is a process that can take several years. In order to answer the research question and achieve the objectives of this research, at least two or more different cases must be studied in order to obtain an understating about how formal control systems affects the individual's creativity in NPD. Worth mentioning is that NPD and formal control processes are sensitive and have high confidentiality which makes it hard to get permission in order to observe these processes. Therefore, observations are not most suitable for collecting data in this specific research which means that the data will be collected through interviews.

The approach that has been selected for this qualitative study is case study. The case study analyses deeply how a specific phenomenon affects the reality of an individuals, teams, organizations etc (Easterby-Smith, 2015). In general, is there two ways to conduct a case

study, it can be done through a single case study and a multiple case study. The single case study is suitable when the objective is to investigate an unique case while multiple case study is used when the objective is to obtain a general understanding among the cases (Yin, 2014). This study will use a multiple case approach in order to obtain a general understanding of the topic.

3.1.3   Case selection

The criteria's used for choosing the respondents for our study are based on the topic. The main criteria are that the companies must have a department who is working with new product development. They must also use some form of process for managing their product development. Participants must be based in Sweden to allow more effective communication because of the face-to-face interviews. 15 companies in various industries were approached by phone and e-mail, from where four companies responded with the answer that they were happy to participate in our study. It was important that the companies that where to participate not were from the same industries in order for us to get a broader variation of views on how they handle and perceive product management. We chose to approach these companies because they were based in Sweden and fulfilled the criteria for participation. The companies provided us with contacts to several individuals that were fitted to participate in our study, whom then were approached with more detailed information about the study and for scheduling a meeting for the interview. Companies developing medical devices are the most mature when it comes to portfolio management (Kester et al., 2011). The researchers both have experience from working with product development in the MedTech industry and due to the good insight, the interviews and collected data could be interpret in an effective and rightful way. The size of the companies participating are presented on a scale based on their number of employees. Scale according to Eurostat´s Statistics explained (Eurostat, 2016).

Company size:

> **Small enterprise: 10-49 Employees**
>
> **Medium-sized enterprise: 50-249 Employees**
>
> **Large enterprise: 250< Employees**

Company	Company Industry	Size	Location
1	Vehicle development	Large	Sweden
2	Branding	Large	Sweden
4	Medical devices	Large	Sweden
5	Machine development	Medium	Sweden

Table 1, table of companies that participates in the research.

3.1.4 Data Collection

Primary data have been gathered by conducting semi-structured interviews with participants in various positions, working with new product development in various industries. Primary data can be described as data collected directly by the researcher. Collecting data by conducting semi-structured interviews in qualitative research provides a less formal interview structure which opens up for a change in the conversation, where the questions follows the context. We chose to collect primary data thru semi-structured interview because it can lead to better insights and greater quality in the research, as explained by Easterby-Smith. When conducting the interviews, the respondents were asked if they could provide information about possible additional respondents. Collecting new sources of information by being provided with a name of an eligible source is called snowball sampling (Easterby-Smith, 2015). This resulted in additional participants valuable for the outcome of our study. Secondary data acts as a complement to the collected primary data was also gathered. This were done by asking the interviewee participants to provide additional documents that could enrich our understanding of their processes.

3.1.4.1 Interviews

The interviews took place in Sweden during the period of 3 April 2018 - 20 April 2018. During this time, 8 interviews were conducted and each one lasted for approximately 45-60 minutes. Multiple interviews were conducted at the case companies to allow us to get a better understanding of their processes and perceptions. The location of the interviews was decided

upon with the respondents and depended mostly on where they felt comfortable talking about the topic without the presence of their superior managers. This was important for us to ensure anonymity and privacy for the respondents. To ensure quality in the interviews and to avoid misunderstanding or misleading, all interviews was done in face-to-face meetings. At the time of the interview, the conversations were recorded and then transcribed later on. Valuable information which was developed by conversations outside the questioning was noted in real-time in order to not misinterpret or have the information biased. Information regarding the participants, length and location of the interviews are presented in the table 2. The questions for the interviews was created based on the topic, because of our insight in the topic due to earlier experience, the questions could be asked in a way that opened up for new contexts without the risk of moving away from the structure. A list including the questions are presented in appendices A and B.

| Case	Company	Participants position	Nickname	Length (min)
1	Medical devices	Developer Engineer	Andrea	45
		Innovation Manager	Bill	45
2	Branding	Industrial Designer	Christina	50
		Senior Design Manager	Daniel	55
3	Vehicle	Design Engineer	Erik	45
		Project Manager	Felicia	60
4	Machine development	Development Engineer	Gustav	55
		Project Manager	Henrik	60

Table 2, interview information including case, firm, nickname for the participant, and length.

3.1.5   Approach for Data Analysis

Easterby-Smith mentioned that the way the data is collected has an impact on how it should be interpreted and analyzed. The data was collected thru interviews from which data was verbally transferred. Therefore, mainly verbal data will be analyzed. While collecting the data, it was analyzed continuously thru an iterative process which made it possible to answer our research question by building a theoretical reasoning. We analyze verbally gathered data while comparing it to with additional interview notes, observations and secondary data in order to support the validity of the interviews. To be familiar with each case as an entity allows patterns to emerge and avoids the researchers to generalize patterns between cases. This also

accelerates cross-case comparison . We chose to list similarities and differences between the cases. Searching for differences in similar cases can break simplistic frames and searching for similarities in cases with differential ties can lead to a better understanding. This resulted in new concepts that we did not anticipate (Eisenhardt, 1989).

In order to analyze the data from a case study perspective we must understand what the units of analysis are. The units of this research and each case are two or more individuals, firm documents and studying events. The data is collected by multiple sources as interviews, observations and secondary data from the, the data is later to be documented and placed in transcripts, from these transcripts there is a coding process where key words, activities and sentences are identified. The coding process was executed in each case. From these codes themes are identified, and these teams are later to be interpreted and analyzed for the research question to be answered (Creswell, 2007). Figure 6 describes the process where it is presented as a hierarchy model and is oriented from left to right. The first steps of the process are to create a foundation that is done by gaining a general understanding of the context and descriptions. The cases are then documented and written in transcripts. From these transcripts is the coding process executed. These codes are then linked from case to case in order to identify the different themes of this study. When the themes are identified are similarities and differences identified (Creswell, 2007).
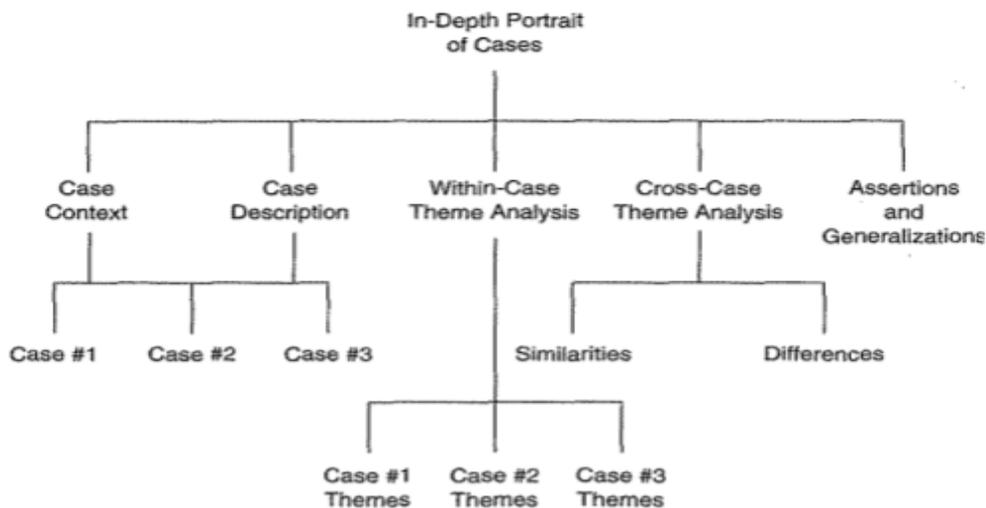
Figur 5, template for data analysis by John W. Creswell (2007)
Source: (Creswell, 2007)

3.1.6 Quality aspects

Our goal is that the research that has been done in this thesis is to be reliable. To ensure quality in the research and to make the content trustworthy, we choose to stand by the criteria for trustworthiness presented in the article: *Criteria for assessing the trustworthiness of naturalistic inquiries* written by Guba and Egon 1981. The four quality criteria´s is Credibility, Transferability, Dependability and Confirmability (Guba, 1981). Each one of these will be taken into consideration in this study and are defined below. Besides the aspect of Guba's quality criteria, the quality of the work in this thesis is also ensured by only using peer reviewed journals in the theoretical framework. Peer reviewed journals ensures that the content is transparent and unbiased (Easterby-Smith, 2015).

3.1.7 Credibility

Credibility refers to that the collected and analyzed data is to be truthful and credible by the participants in the study. The informants agree with the findings and believe that the information is truthful (Guba, 1981). There are several methods to ensure credibility in qualitative research, triangulation, peer-debriefing, and member-checks. Hence, an effective way to ensure credibility is to collect data by engagement over a longer time span. Our aim was to make our research as credible as possible, which we have done by carefully choosing the participants in the study by reviewing their current position and background. The main limitation to ensure credibility in this thesis have been time constraints.

3.1.8 Transferability

The second criteria presented by Guba is transferability and it means that the findings can be transferred into other contexts by providing a thick description (Easterby-Smith, 2015). We have been able to establish transferability in our study by providing a rich description about the selected cases, companies and informants, which allows the findings to be applicable in other contexts. Providing a thick description also allows generalization of the result (Guba, 1981). Clearly stated assumptions and information lead us to believe that our result is applicable in other contexts regarding research about NPD. Due to ethical and confidential considerations, the provided descriptions regarding our selections couldn't be as thick as possible.

3.1.9 Dependability

Dependability refers to how consistent the findings in the research are and if it can be repeated by others. Dependable study can also be addressed as stable (Guba, 1981). In our

study we have chosen to collect data thru overlapping methods such as interviews. By providing explanations for the steps in the method and to how the conclusion is developed we make the study stable and easy to follow, to allow it to be used in future research.

3.1.10   Confirmability

The last quality criteria distinguished by Guba is confirmability and it describes the extent to which the result of the study is shaped by respondents or by the researcher's bias (Guba, 1981). Methods to establish neutrality in the research can be triangulation or reflexivity (Easterby-Smith, 2015). The data presented in this thesis are objective and driven by the purpose of the study. Reflexive awareness throughout the study and by using triangulation, our interpretations and findings can be traced back to the data. Our experience in the area of the study have made it possible to develop interview structures that allows us to make sense of the information, without the risk of leading the respondent's answers or for it to be biased.

3.2   Ethical Considerations

To take ethical aspects into consideration while conducting research is important, both for comfort for the informants and to ensure credibility in the research (Easterby-Smith, 2015). By paying attention to ethical issues throughout the research we have been able to establish a safe environment for respondents while gathering empirical data. Because of the somewhat sensitive topic, the ethical considerations that were made focused on anonymity for the respondents and their employers. The ethical considerations used in the thesis is grounded upon the 10 key principles in research ethics presented by (Bell & Bryman, 2007). When first contacting the selected case companies, informed consent where provided by a clearly stated research purpose and topic. For the companies to decide on their participation, they were also informed about the outline of the study and what was expected from them. Informed consent is an important aspect to not cause any harm to the informants by investigating whether the benefits outweighs the risks of participating. To protect the anonymity of the individuals participating and ensuring that the informants where comfortable giving honest statements and answers despite the sensitive topic, no real names or other personal information are used in the research. Nicknames including the title of the respondent are used for the informants and the received data have been anonymized. Keeping the collected data confidential where an important aspect for the selected companies to participate. To ensure this, no company names have been stated in the report, instead the case company's industry and size are stated.

By standing by these principles for research ethics presented by (Bell & Bryman, 2007), we could assure that no harm came to the participants and to avoid any wrongdoing. Weight where put on the principles that was most important for ensuring the ethical perspectives during this study, but this does not neglect that other various ethical principles was taken into consideration during the study to ensure a safe environment for all participants.

4 Empirical Findings

Chapter four presents the empirical findings that has been divided in four cases. Each case includes data that has been collected from both primary and secondary data. The primary data has been collected by conducting 8 interviews, where the participants are both engineers and managers. The secondary data is used as support.

4.1 Case 1

The first case takes us to a firm that develops medical devices. The firm sees themselves as the market leader in developing medical devices. They have great ambitions to keep their market position and are continuously developing their current products and new products. While entering the office in order to interview the participants of case 1 we noticed how team oriented this office works, this was noticed both in the office atmosphere and by the layout of the office. The open office landscape indicated on a continuously open and warm dialogue between the employees. As we entered the firm, a secretary guide us to two different conference rooms where the two participants waited for us, we separated and entered each room.

In the first room we met a senior development engineer that has been given the nickname Andrea. Andrea has been working for this firm for over a decade and has been involved in several new product development projects. The senior design engineer has a long experience in new product development, Andrea used to work in the automotive industry but left it because she felt the need to use her development skills to make a difference and help people, Andrea feels that this is possible to do through the current firm which is one of many reasons why she has stayed there for over a decade. In the other conference room can we find Andrea's manager. The manager Bill is younger than Andrea and has been working there for approximately six years. Bill started the career at the firm four years ago when he first started an internship at the firm and after that worked there as a trainee in innovation management. At the moment is Bill managing the innovations team where we can find Andrea and five other team members.

NPD Process

Both Andrea and Bill describe the firm's new product development process as a structured process. In the early stages of the NPD process is the development of the product customer oriented, worth mentioning is also that the customer in this case is not the end user. The innovation team meets up with the customer which describes what they are looking for, what applications, functions etc. that the product should be able to offer the end users. When the innovation team has obtained an understanding of what the customer is looking for, the team starts working to develop a new product. The innovation and idea generating phase is where the team members can be creative and develop their view of the product that has been described by the customer, where they also can add functions and features which they believe can add value for both the customer and end user. During this phase is the innovation team also investigating the end users by doing a user's study in order to identify their needs and demands. This phase of the project is a time-consuming phase, the reason for this is to create a stable foundation of the product that is to be developed. In order to move on to the next phase there is a two-step gate that the innovations have to pass by, the first step is an internal go/kill stage where the innovation team examines the innovations. The innovations are then set against each other in an evaluation matrix where the innovations that matches the customer and end users demands goes through to the next stage. The next stage is an external go/kill stage where the innovation team meets the customer and presents the innovation that passed through the first stage. The innovations are presented, and the customer receive the information and chooses what/which innovations is to be developed. During the interview, Bill provided a document which included a flow chart that showed their process used when working with NPD. This document supported the data that we had gathered through the interviews.

Employee Perception

Andrea perception of the firm's early stages of NPD process is that there is room for being creative and innovative, were the team is given a free role but are still working towards the customers description of their view on the product. Andrea describes the NPD process as a formal and structured process that leads to efficiency and clarity when working towards the customer expectations. "our process gives the customer what they want, we develop products according to their thoughts and realize them". While working towards a customer must one keep in mind that the customers does not always have the same mindset as the

innovation team. According to Andrea could this be an obstacle, depending on how openminded the customer is.

Andrea explains that the main issue with their processes is not how formal and strict their NPD process are. It has happened several times that the innovation team considers some functions and applications to be important for the product, but the customer disagrees, and in the end of the day does the customer have the last word. "I would say that the process is urging us to be creative, but in some projects can it be hard to be creative because the customer already has a clear picture of how the product should be and shuts out our creative suggestions that we consider will benefit both customer and end users". This is something that she considers to be a major issue, while working towards a customer is the goal to satisfy the customer and develop their product, even if the innovation team considers that the product could be more innovative. Andrea feels that over time this has affected her motivation to be more creative and innovative, which has led her to develop less discontinuous innovations and more continuous innovation as Andrea describes as the safe card.

Manager Perception

Bill perception of the firms NPD process is as mentioned a formal and structured process, the early stages is to encourage the team to be more innovative, they are given a free role to investigate how they can develop the customers description. "Our first milestone in the innovation process is to deliver a couple of innovations which we have developed after examining the needs of the market, customer and the end users. With the knowledge that we gain from the market, customer and end users the engineers have free hands". The creativity differs from team-member to team-member, the more experienced team members are used to this structural process and knows what is required for the innovation to pass the go/kill stages. Team-members with less experience tends to present their innovative side, where they bring more discontinuous innovation to table, by combining the minds of the team members and their ideas can they together develop innovation that are new and satisfy the market, customer and end users. The manager explains that the process encourages the team members to be more creative and that the creative part of the project is what motivates the team members. At the end of the interview, we asked Bill the following question:

Bill explains that he does not think that implementing a more open structure would add any value when it comes to being innovative, creative nor motivated. The structure that they have implemented has developed over a long time and is working very well as it leaves room for the team-members to be very creative as well as it does have a clear guide of how the project is executed. The managers are well involved in the steps of the project while having faith in their subordinates to deliver quality solutions.

Conclusion

The first case presents a side of NPD where a structured way is the most suitable when working towards a customer. Both the developer engineer and the manager have a clear view on how the process works, it is a structured process where each process ends with a formal meeting where the team members together with the customer present the status of the project. The case shows that it is an efficient process where there is room for creativity, but in some cases barriers could arise from the customer that may limit the creativity for of team.

4.2   Case 2

This case study was conducted at a large branding firm that develops radical design solutions and products for their own brand. A big part of their business is to also acts as design consultants to other companies in various industries. They are mostly developing equipment for diverse extreme sports. Their brand is very strong in the market and we choose to contact them because their innovations and designs is very appealing and exciting. Due to high levels of confidentiality in the company, the interview with an employee at the company took place in a café in Jönköping, Sweden. The respondent then provided contacts to a manager which led to an additional interview with an experienced manager which was conducted in a hotel conference room, also in Jönköping, Sweden.

Christina have worked as an Industrial Designer for the company for about 4 years and have been involved in several projects that have resulted in products that are well known for most people in their day-to-day life. Christina has a bachelor´s degree in Mechanical Engineering and a master's degree in Industrial Design. The main responsibilities that comes with this position is to be a part of the entire design process while working closely with the customer.

Activities includes design research, ideation, concept development, CAD modelling and prototyping.

Daniel is a Senior Design Manager at the company and has worked there for 9 years. He explains his background as irrelevant and describes his responsibilities within the firm instead. As a senior design manager, Daniel manages the projects that is assigned to lead the design projects that the company is undertaken. Daniel says that, "Managing projects means making important decisions during the projects which will have a great impact on the outcome".

NPD Process

Christina explains that, their new product development starts with a customer reaching out and briefs them on a project, which mostly includes an idea of a product that they want us to design for them. Two persons from the design department, usually an industrial designer and the appointed senior design manager meets with the customer to collect more information and straighten out all questions regarding the project. Next, a team for the specific project is assembled. A time plan that demonstrates the process, which methods that will be used in the project and includes all activities and deadlines is developed together with the team. Daniel explains that when the project planning is done it is his responsibility to approve it before the project continuous with the team to collect all necessary research and start generating ideas. Several concept sketches are then presented for the senior design manager and Christina explains, "The concepts that we are moving forward with are decided upon together, even though the manager has the final decision." She also explains that the senior designer who is on the team gets better opportunity to outer his opinions than younger designers. Daniel handed us a report document from an old project that would better show us how they work in their process. Daniel mentions that he trusts the experienced designer's opinions more than the junior designers. Their way of working is described as, "We have a very strong and clear way of how we work, and I believe that is why many companies chooses to hire us instead of other agencies." Which tells us that they don't have a specific formal control structure for managing their projects, but they have a standardized way of executing their projects which includes less formal gate meetings. This finding is also supported by the information in the project report that we were provided.

Employee perception

"My general perception of the way we work is that all members of a design project team are able to have a big impact on our development process", Christina explains. She also states that every project that she has been a part of has taken different directions regarding on the execution process, because the specific project has specific activities to be done. Christina tells us, "I get the feeling that our department is very poor in defining clear goals and directions in the projects". She explains it as if the planning phase is something that the managers just wants to finish quick in order to get started with the ideation phase. Christina also implicates that even though she feels that the team members have a chance of sharing their opinions to affect the project outcome, she often feels that the final decisions are made by their managers outside the meetings. When asked about if this process allows her to be creative, Christina answers, "Very much so! It is a process where the individuals get to use their creativity to develop the best products".

Manager perception

"As a senior design manager, I work closely with the individual designers in my teams and I believe that I give them the opportunity to always be innovative and I support them to develop radical ideas". As go/kill decisions are made, Daniel tells us that he often gets pressure from above to follow the company policies. Even if he likes a very creative idea, he sometimes must terminate it to satisfy his bosses. The processes that they work according to is very open and not formal in a way that different projects needs different activities for the outcome to be successful. At the end of the interview, we asked Daniel the following question:

- *Do you think that you will be better at fostering the creativity in your subordinates if the company implemented a more formal structure for NPD?*

Daniel answers, "I don't think that it will, in our industry, the design industry, there is a culture of working in a relaxed, unstructured way with an environment that brings out the artsy feeling in us designers". This is the reason why creative individuals seek to work with industrial design and to change that to formal processes would have negative results on individual creativity and motivation.

Conclusion

They have a way of executing their projects, although the guidelines are poorly followed, projects take the path the results lead. This unstructured or less formal process makes the individuals to feel creative and involved but with more thoughts put into it, their answers about creativity moves towards the other direction. Although, the design culture desires using an unstructured way when developing new products.

4.3   Case 3

The third case was done at a company which is a large player in the vehicle development industry. The company is known worldwide and has its headquarters in Sweden. Always developing solutions for their products with the latest technology made them a perfect candidate for this thesis. The interviews took place just outside Stockholm in Sweden. After being in contact via email, we were invited to interview a manager and an engineer at the company facilities. When entering their offices, we got the feeling of a very traditional and structured work environment, which was quite different comparing to the other companies that we have studied.

One of the interviewees from this company is a design engineer. Due to privacy aspects, the participant will be called Erik. Erik has a bachelor's degree in Electrical Engineering and has been employed at his current position for 3 years now. The day-to-day tasks and responsibilities that comes with being a design engineer is to execute the activities that is planned for diverse projects. Erik works at the innovation department and focuses on developing technical solutions.

We also got an opportunity to interview a project manager, given the nickname Felicia. Felicia works at the innovation department and has been a project manager for 6 years. Before getting the position as a project manager, Felicia worked at a small consultancy company as an engineer. As in most project manager positions, the main responsibilities are to structure and to follow through the projects that the department has undertaken. At this company, Felicia explains that she is a part of making a lot of decisions regarding the projects.

NPD Process

When listening to the answers of the participants, both Erik and Felicia's answers are very close to each other. Both explains that the company works in a traditional way and has been using the same processes for a very long time. Erik explains it as that there is "...a very clear way of working with new product development as it is divided into a number of phases". While Felicia says that the projects includes a general set of steps, in which every step is followed up by decision meetings before moving on to the next step. To support the information from the interviews, both Erik and Felicia referred to a part of their website that displayed their development processes in general. The phases used in executing the projects does not differ from one project from another. Projects usually begin with research on customer demands, a planning meeting starts the project and different responsibilities and activities are distributed among the team members. The first step is specifying demands, properties and functions of the product, this is done together with the whole team as a workshop. Next, the idea generation phase, this is where Erik says that he gets to be the most creative during the whole project. The only thing that can disrupt Erik's creativity is the guidelines for the products features. This is then followed by a decision meeting where a decision is made of which concepts that will be continued. The concepts need to meet the criteria that were decided upon in the beginning of the project and the project manager makes the final decisions. Felicia says, "In the projects where we are developing new projects, I as a project manager will make the final decisions". There is room for being creative while developing concepts or products, but the decisions are made by the criteria and the project manager.

Employee Perception

This process act as a guide to execute the projects, which all members are aware of. The phases and processes used is clear to everyone which results in a small amount of disagreements arise, which is good for the progression of the projects, as Erik explains. This traditional way of developing new products has been successful for a long time at this company and believes that it is the best way. On the downside, the project does not allow team members to be a part of the decisions more than while developing the criteria that the development of the product will follow, opinions can change a lot during the processes of developing solutions for the products. This way of working is so well implemented at the

company and Erik says that he thinks that it might have caused that a lot of ideas never reach their full potential as the products are strangled by the criteria.

In between the decision meeting, Erik feel like he really can use his creativity to the fullest. The predetermined criteria and the knowledge of the project manager makes the final decision does not avoid him to outburst when it comes to being creative. Although this might be a problem for other team members that works with other types of development apart from electronical technology. When it comes to motivation to work, Erik tells us that he is like anyone else, "Of course there are some days when I feel less motivated, but it is not connected to the way we work with new product development". The process used would might need an update as many smart innovations and solutions gets terminated due to much focus on the product criteria. To change the process would be very hard and take a long time, as it would have to be done by top managers who is not involved in the projects.

Manager Perception

Felicia feels very positive towards their way of working. Felicia explains it as structural and clear. "With this process, everyone knows what has to be done in order to develop successful products". Felicia believes that the process allows the members working in the projects to be creative and that she always tries to support them when they get stuck. Felicia continuously follows up the progress of each individual for the project to stay on schedule and assists in any way she can. Felicia has similar thoughts on the weight each project puts on following the criteria but says that the criteria is very well developed in order to not exclude any radical innovations. If the structure of the process should be updated, Felicia would want to change the formal way of thinking and make it more open in order for change of opinions to help the innovative development of the products. One of the reason for the successful implementation of this process is that everyone knows what to do which excludes any uncertainties and makes it easier to be motivated to finish the tasks. "If I wanted to implement any changes, it would be a long process as the hierarchal structure at the company is very complex and includes many levels. A decision like that would have to come from the top". Felicia was asked the following question in the end of the interview:

- *Do you think that you will be better at fostering the creativity in your subordinates if the company implemented a less formal structure for NPD?*

Felicia answered, "I am sure that a less formal structure would increase the creativity in the persons involved in the development of new products, but I am also sure that it would cause other problems such as less efficient development, more costly development and issues with authority". Felicia says that the organization is too large to use open structures that allows interpretations and that it would result in negative effects on their new product development over time.

Conclusion

We get the feeling of both participants having doubts about the formal structure of the process and both have similar thoughts on changes that could improve the process for how it improves creativity. The process of change is too difficult to follow through that they are satisfied with the way they are working now.

4.4   Case 4

Case 4 took place in a company that develops smart solutions for cable-handling machines. A company with high ambitions of being leading innovators in their industry. Their ambitions for creating an innovative work environment hits us directly as we pull up to their headquarters just outside Stockholm, Sweden. The building is shaped like a triangle to represent that they work together and is inspired by how birds fly in pack. The environment inside is very easy going and the office is structured as an active environment where colleagues works in various places without personal offices. As we entered, a secretary guided us to a conference room where the development engineer that we had been in contact with was waiting for us. While entering, they suggested for us to interview another employee that they had prepared. The additional interviewee was a project manager at the company. We decided to split up and conduct the interviews in separate conference rooms in order for us to get information without the risk of it to be biased.

The participant, Gustav, works as a development engineer at the company and has worked there for about 5 years. Gustav started working there directly after he graduated from a bachelor´s in Mechanical Engineering. He explains his day-to-day work as, "I would say that my main responsibility is to be an innovative innovator". Gustav's work involves being active in executing the realization of the product, which includes designing, constructing, managing the production and help the customer to plan and implement the machine in their production

plant. The most important part according to Gustav is to develop innovative solutions and designs.

The project manager, Henrik, has worked at the company for 4 years but only as a project manager for a year. Before Henrik was appointed project manager, he worked as a development engineer at the company. The main responsibilities for a project manager is to assist the development engineers to progress in the project that they are assigned to, make decisions and provide necessary information and resources to the project.

NPD Process

Gustav explained their process for development of new products as that "I would not say that we have a structured process for developing products or idea generation". While explaining his responsibilities and the team's way of working, Gustav got to the insight that they indeed have a somewhat structure for new product development and that it is formal in a sense that it is repeated and applied to all their projects. His statement of not having any specific structure for developing new products comes from that it is not out spoken by his managers. Henrik says that their process is very free and open but that it follows certain guidelines that helps the projects move forward, such as decision-making meeting with project managers. When the team first receive information of what kind of function the product in a new project needs to have, they have a meeting where they discuss design solutions to achieve the specific function. The project is then appointed by the project manager to what Gustav refers to as a "project owner" and says that, "Then it is the project owner's responsibility to realize product and make it work". Each project is continuously followed up by meetings to help the projects move forward, decisions are made together with insights from several co-workers and project managers, but the final decisions are always made by the project manager. Henrik view of the new product development at the company is very similar to Gustav's, maybe because he recently was in the same position as Gustav. At de end of the interview, Henrik showed us a project report that gave us a clearer picture of how their projects are executed.

Employee perception

According to Gustav, a downside is that this process can create a lot of pressure on the project owner to deliver an innovative, good looking and functioning solution. Feeling pressured can lead to the opposite effect of being creative. The processes free and open structure includes a lot of individual decisions along the development which can lead to poor results because of the absence of input from others. One of the biggest upsides of working with this type of unstructured process is that the person working inside the project, the project owner, are able to be a part of and have an impact on the decisions that are being made. This creates a free and positive work environment where your competence feels appreciated and trusted upon. The development of new products always starts with customer contacts and discussions regarding required functions, this is very important aspect of why our products is so successful. Projects starts with very small restrictions and then it is up to the project owner to create a smart and innovative solution. Gustav tells us that "This process allows me to be as innovative as possible. I can't think of a better way for our department to structure the new product development".

As mentioned above, this unstructured process can have a negative effect on the creativity, because it can create pressure on the project owner. Gustav explains that he sees this as an opportunity to be creative instead. "This way of working alongside with our work environment allows me to be very creative with very few requirements and guidelines, I can really develop radical products".

The feeling of being pressured to deliver can also affect the motivation in a negative way. Gustav says, still, our perception is that it is a positive way of working because it comes with great responsibilities and is very open to develop and realize all ideas without having to follow guidelines or organizational expectations. Gustav tells us that this unstructured process makes him feel appreciated which motivates him to keep developing creative and innovative solutions. "If it came to a point where I wanted to change to the way we work, I don't think that my boss would support them." Gustav says. The company's current work environment and processes is a part of the top managers vision for the company. The process is working fine at the moment and will not change before the organization is growing.

Manager perception

The work environment and the unstructured process is according to Henrik, the company's winning concept. Together they create an environment where their employees get a lot of responsibility and free hands to develop the most innovative solutions possible. Henrik tells us that, "I believe that our processes work very good for our organization and our vision for the future". The managers act not as decision makers for the good of the organizational politics, but more as helping hands in order for the project to proceed in an effective way with successful results. Henrik tells us that the founder of the company has a background as a designer and believes in radical innovations himself and that he is the reason for the company to function the way it does. At the end of the interview, we asked Henrik the following question:

- *Do you think that you will be better at fostering the creativity in your subordinates if the company implemented a more formal structure for NPD?*

Henrik answered, "At the time, no. But I don't think that our work environment would function in larger companies with more stakeholders. When the company grows, we will have to review our processes and probably implement a clearer structure for new product development".

Conclusion

This unstructured way of developing new products seems to allow individuals to develop radical innovations and being creative without a lot of requirements or guidelines, although it can also have a negative effect on creativity and motivation due to great responsibilities and pressure to deliver.

5   Analysis

Chapter five presents how we have been analysing the empirical findings and combined it with the theory. The analysing has been done by identifying different themes from the cases then make a cross case analyse where we identify differences and similarities between the cases.

5.1   Theme Analysis

The theme analysis process is divided in five steps, the process is inspired from the case study template by John W. Creswell that is presented in section 3.1.5. The first step is to create a foundation to the data analysis by document the data that has been collected from the cases, by doing so can we organize the data and prepare it for the coding step. In order to start the coding process must we be familiar with the data in the transcripts and review it. The codes could be seen as key words, activities and phrases in the transcripts and by linking the different codes can themes be identified. When the themes have been identified they are interpreted in order to find similarities and differences and if they are interrelated, the process is summarized in figure 6.

Transcripts	Coding	Identify Themes	Similarities Differences	Select themes	Analysis

Figure 5, Theme analysis process

5.1.1   Coding

There was in total four transcripts, one transcript for each case. The transcripts summarized the interviews in dept along with firm documents that gave support to the data that was collected. From these transcripts, the coding process could start. The coding was conducted by reviewing the transcripts in debt where each phrase and sentence was investigated, each relevant phrase was documented as a code. Phrases that did not give any value to the research were not considered to be key codes and was not included. The codes were later documented in an excel document, in total were there 21 concrete codes, that was for example *pressure*, *stress* etc. from these codes patterns between the cases could be identified which resulted to abstract themes.

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5.2 Themes

From the coding, four themes could be identified. The four themes are: *External impact, pressure to deliver, company size* and *desire to change.* The different themes were spotted by investigating the codes in dept, erasing all synonyms and by finding concrete codes. The phrases and codes were later linked together, the linking was done by assuming that there was both a direct connection and an indirect connection between the codes. When the codes were linked together they were examined. The result was four abstract themes.
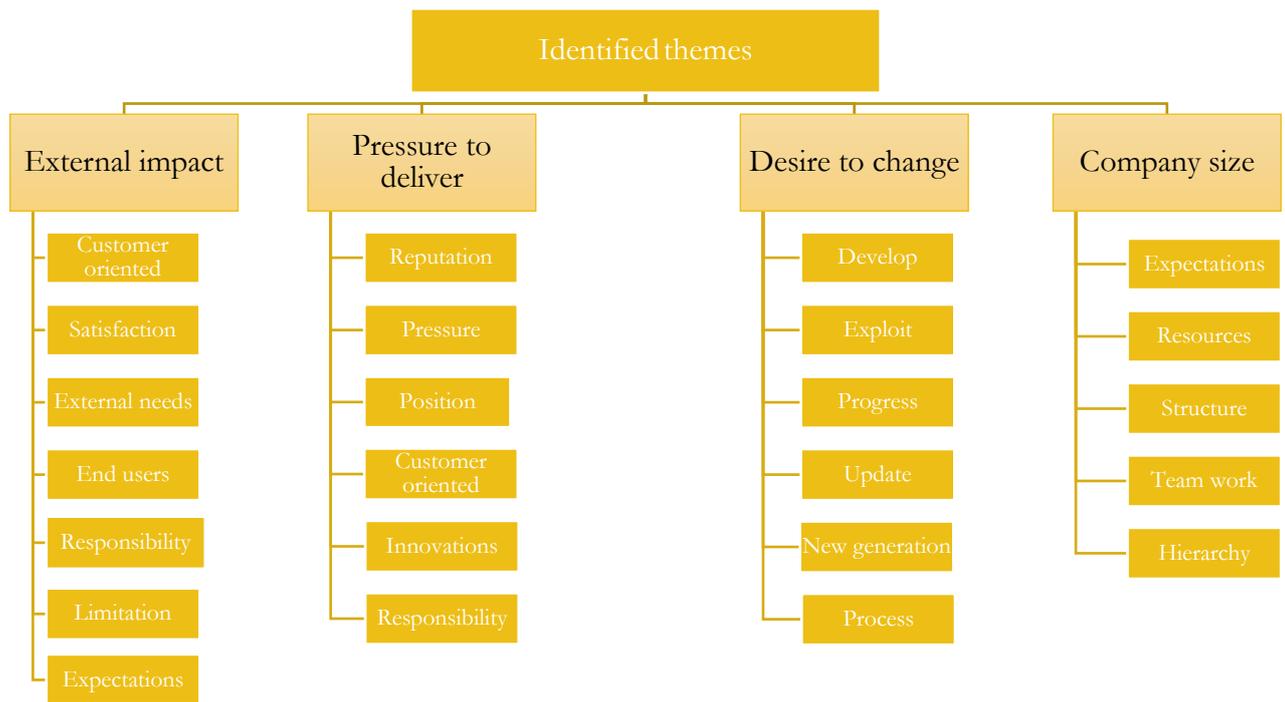

Figure 6, Presentation of the different themes and their codes

Figure 7 presents the different themes and the codes that developed the themes. The four themes are still abstract and can be deceptive, therefore a short definition will be presented in this section and an in dept description in the specific themes section in order avoid any misunderstandings.

- **External Impact:** With external impact we focus on the external parties that affects the process. The external parties can be for example upper management, customers or other organizations that are affecting the NPD Process.

- **Pressure to deliver:** With pressure to deliver we focus on how the individuals experience their situation and how their managers are using their leadership skills to help their team members.
- **Desire to change:** The desire to change was one of the concrete themes that was identified. In every case was it indicated that there was a desire to change the processes and continuously develop the organization.
- **The company size:** With the company size we focus on how the size of the firm affects the process and how the process differs from large sized firms to medium and small sized firms.

With these four different themes can we proceed to the next step of the analysis which is connecting these themes to theoretical findings. The next step is divided in two subprocesses, each subprocess plays an important role of the analysis of this study. The first step is to present the codes and connect the empirical findings of each case to themes and present its relevance. The next step is to connect the theme and its empirical findings with the theoretical findings.

5.2.1 Theme 1: External impact

The external impact was a pattern that could be identified in all four cases. A collection of several codes led to this specific theme. When investigating the formal control system can one not neglect the impact of external factors and actors. While working with larger projects, several actors are involved in development of the product and when we are working with several actors the NPD process should be as formal as possible in order to argue and explain the choices so that all actors can accompany.

The external impact comes in different shapes during the new product development processes, we can find it in the form of customers, suppliers and upper management. The new product development teams, and innovation teams feels that they have a responsibility to satisfy the external participants and develop innovations in a limited timeframe. The individuals within the innovation team feels that there are several external factors which affects the NPD process, regardless of whether it is a formal or informal process. The main issue with the external impacts is how it effects the kill/go stage, this is stage is common in the different cases. This shows that the formal control system itself is not the biggest issue

in these cases, it is the expectations, demands, limitation and lack of knowledge which complicates the process and strangles the creativity.

The importance of including the customer in customer-oriented projects is essential in order to obtain high quality and satisfy the customer. The customer develops the foundation of the product, they provide guidelines and information (Cui & Wu, 2017). Although they have a big positive impact in the project, there is also a risk that they create obstacles for the innovation team. The lack of knowledge and their own priorities affect the process by creating boundaries for the innovation team (Yang & Zhang, 2018). This was also shown in the cases, the development engineers felt that the limitation, boundaries and lack of knowledge gives them an insecure feeling to think outside the box, because the innovation may seem to discontinuous/radical. This pattern is also shown at the impact of upper management.

The impact of upper management has been showed to increase the motivation and performance of individuals in new product development teams, the upper management is also able to monitor the projects, setting up goals, limitations, deadlines and etc. (Bonner, Ruekert, & Walker, 2002), which could be seen as positive factor depending on your role in the project. In the empirical findings we identified a pattern where the managers react positive to this, but the individuals in the NPD team have a different view. From the cases can we find that the development engineers experience that the they become more controlled with the formal control systems and the upper management. In parallel with the projects being more formally controlled, the development engineers becomes more locked, their innovative and creative side is reduced (Bonner et al., 2002).

5.2.2 Theme 2: Pressure to deliver

Pressure to deliver innovations is a theme that was identified in all of the cases but was highlighted mostly in the case companies using an unstructured process. Without the gate meetings the decision-making fall on the individuals within the project, this results in an increased pressure to deliver. A collection of several codes showed the pattern to this theme, we find codes as *reputation, lack of knowledge* and *responsibility*. The development engineers and company documents from the empirical findings provides information that helps to identify a pattern where the development engineers want to become more innovative and with the information that they obtain from the user-studies, market analysis and etc. is it possible.

The interest to be more innovative and creative is mentioned in all cases, and the individuals from the cases feels that there is room for being innovative and develop discontinuous innovations but need to keep in mind that they may not receive support to proceed in the formal stages of the new product development process. The individuals from the cases explains about their experience of several times when they did not receive support for their discontinuous innovations, this is also something that was noticed during the collection of theoretical data were the lack of support were mentioned several times as a key factor that reduces the emergence of discontinuous innovations (McDermott & O'Connor, 2002).

The support comes in different shapes, it could come from the team members, the external parties but mainly in the cases could we find that the support the individuals are looking after is the support of managers and project leaders. The cases and secondary data as company files presents a reality were the managers and leaders could increase their support for the individuals within the NPD teams. The different managerial and leadership behaviour that can increase the support to innovative teams is a highly covered topic, we can find the typical behaviors as transformational leadership and transactional leadership. The strategic leadership is an essential factor in order to motivate and minimize the pressure and tenure in new product development teams (Jansen et al., 2009). The two most mentioned strategic behaviour of leaders are transformational leadership and transactional leadership. Transformational leadership encourages risk taking and a creative mindset and supports the followers to be more engaged in exploring discontinuous innovations (Gumusluoglu & Ilsev, 2009; Jung et al., 2008). Transactional leadership is mostly known as management by exception behavior and laissez faire behavior. The prior one is a behavior described by a leader's capacity to not take any actions at all times. Management by exception behavior is when the leader takes action against the subordinate if the expectations are not met (Elenkov et al., 2005). Both literature and empirical findings presents information which shows the reality that the two types of leadership behaviors encourage creativity and are suitable in different types of situations. For discontinuous and radical innovations are a transformational approach more suitable and for continuous innovations and development of exciting products are a transactional leadership approach more suitable.

5.2.3   Theme 3: Company size

The third theme that was identified is the company size, it was identified from codes as, *structure, hierarchy* and *resources.* According to participants the company size is connected with

the formal control systems. Small and medium firms that has been participating in this case shows a more unstructured process to develop their innovations on, which leaves both space and time for the creation of discontinuous innovations. Another factor that differs the small firms from the bigger firms are the resources. The resources in this context is mainly aimed on the people, from the highest managers to the individuals. With a lack of upper management there is more room for the individuals and project managers to take initiative which opens for a more creative and innovative development of the products (Bonner et al., 2002; McDermott & O'Connor, 2002).

5.2.4   Theme 4: Desire to change

The fourth and the last theme that was identified was the desire to change among the participants of the cases. We found keywords as, *develop*, *update* and *progress*. These are keywords which appeared several times while discussing about the future vision of the companies NPD process. The answers differed from case to case, but the outcome was the same. At the moment the interviewed managers seemed pleased with their way of working, while the employees showed to have reflected on changes. Organizations invest to have qualified employees but are often blind to environmental change (Zhou & George, 2003). Employees trying to implement changes in their practices without authority can create frustration and irritation. This is something that the case studies in this thesis reflected upon, the individuals working with their current processes had thought on changes that would improve their creativity, effectivity and results but they were reluctant to address these ideas of change to their managers, as they felt like it would not be followed through. The main reason, according to our study was that the individuals with ideas on change felt like there were to many levels of managers to reach for implementing a decision of change in processes. Zhou also addressed that, a minor change in work procedure could result in reaching higher levels of creativity.

The studies have showed that, for employees to get their voice heard regarding changes is something that is missing in organizations today (Amabile et al., 2004) also identified that feedback mechanisms are missing when it comes to organizational creativity. The identified thoughts on change in the cases were connected to their ability to be creative and deliver innovative solutions. This shows that for individuals that are working with NPD to be a part of shaping the process could improve the processes way of fostering creativity, (Martinsuo & Poskela, 2011) discussed that fostering creativity and developing innovative products

could develop changes in a company's business strategies, capabilities and work environment to improve their future position.

5.3 Analysis of the four dimensions

The four themes are referred as dimensions in this section. While analyzing the outcome from the cases can we agree upon that the four themes are central dimensions of formal control system. One cannot neglect the external impact, company size, pressure and change while investigating the effect of formal control systems the new product development process.

The different dimensions of formal control systems present an overall understanding that the main issue does not lay in the formal process, but in the reason of why we have formal processes. While working in larger sized firms, customers and the external actors becomes more involved in the new product development process. The formal control system is more suitable for these larger firms working with larger project with several actors, the reason for why it is more suitable is because the actors and investors want to be more involved and understand what is being done and why it is done that way. A formal control system makes it easier for external and even internal actors to understand the development of the product. The issue of the dimension which represent the external actors, is mainly lack of knowledge which makes it harder for the external actors to understand the developers and the development of their product. The lack of knowledge often leads to questioning of the development which affect the motivation and creativity of the individuals.

The two dimensions, company size and external impact are connected to the third dimension which is the pressure to deliver innovations. Working with larger firms with a well-known brand creates an atmosphere to always be able to develop high quality products, this can result in that the developers feels a pressure to always deliver. The pressed atmosphere can also come from the external actors who have their requirements and expectations on the developers and the products. The pressure to deliver depends on subjective factors, and the reaction is subjective as well. While some becomes more effective and creative in pressured atmospheres are there others who becomes more stressed and less creative. What is certain is that the company size, external impact and pressure to deliver affects the creativity.

The last dimension is the desire to change, the desire to change and develop the process is something that all cases have in common. The cases provided with information which presents that companies endeavors to provide the developers with increased space in order to increase their creativity. The continuous development for organizations are crucial in order to maintain their market position and not to fall behind their competitors. Making changes in organizations is a challenging process which affects the dimensions. Large sized firms which are working together with several external actors has it harder to change their processes without affect the external actors. Making changes can also create a pressured atmosphere for the developers who feel that they have to adapt to a new process.

There are differences between the different dimensions, but they are still linked to each other. These four dimensions creates a thread throughout this research. They help us to confirm that formal control systems are affecting the individual creativity in new product development teams. The effect of formal control systems creates room for creativity, but the consequence of implementing formal control systems and working with several actors adversely affects the creativity.

5.3.1 Conceptual framework

Figure 3 presented a hypothetical framework, which explained the relationship between the main actors that have been investigated in this study. The main factors are the individual creativity, formal control system and leadership behavior. The theoretical findings presented the connection between leadership behavior and formal control systems, and also the connection between leadership behaviors and individual creativity. The link between formal control systems and individual creativity was not yet confirmed. With this research the link between these two factors can be confirmed. By confirming the link between these three factors could a hypothetical framework be developed.
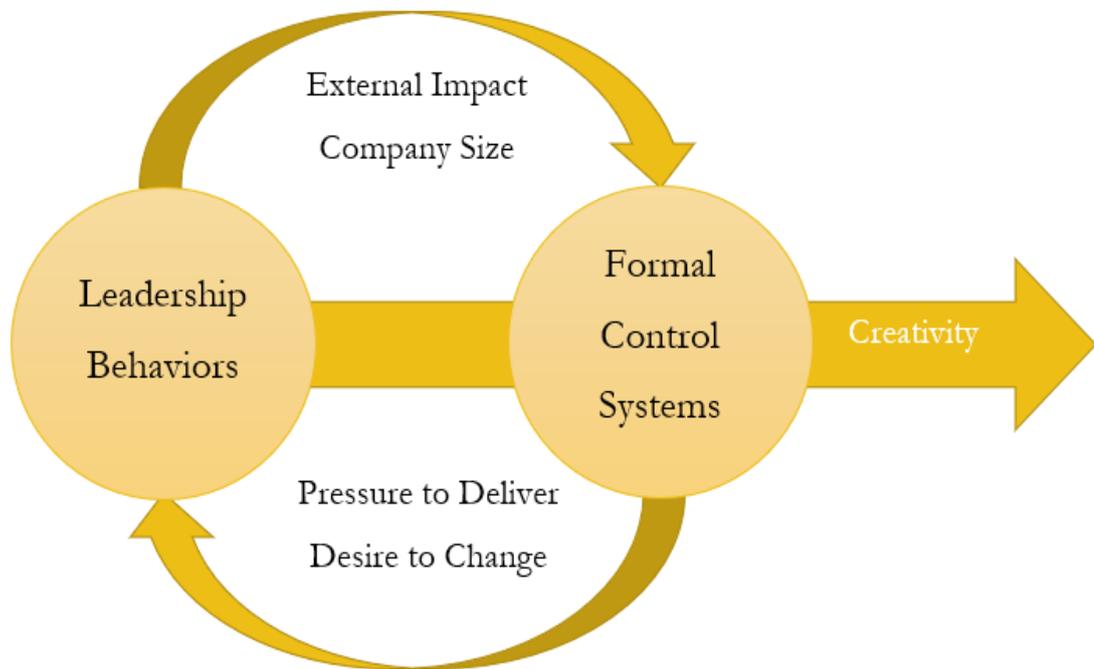
Figure 7, A model of our Conceptual framework, which presents the relationship between the three main factors in this study.

Figure 8 presents a model of our conceptional framework that has been developed from the analysis of the empirical and theoretical findings. The four dimensions has been divided in two categories, a process developer category and a feedback category. The model is a presented as a cycle to highlight the iterative process, by continuously developing the process and obtaining feedback from the individuals in the new product development teams can organization use the formal control and the leadership behaviors to increase the creativity of the individuals within new product development teams.

6 Conclusion

Chapter six present the conclusion of the study, where we summarize the outcome of this study and how we have managed to answer the research question.

The research purpose was to investigate how control systems used in new product development affect the creativity of the individuals that are working in development teams. The investigation of the impact on creativity has been studied from the perspective of how different structures of the control systems influences the ability for individuals to be creative. Throughout the study, leadership behaviors in managers that are best able to structure the control systems for it to foster creativity, has been continuously touched upon. First, we explored the topic in a theoretical context by building a theoretical framework that gave us a clearer view of the field and what to further study. The theoretical framework developed an understanding of the topic which has been displayed as a model in figure 3. This also provided the research question that we in this thesis has aimed to answer through data collection followed by an analysis of the collected data.

The findings, which was gathered through multiple case studies including semi-structured interviews and secondary data, discussed the new product development processes of diverse companies. Discussions about how both the employees and the managers perceive their processes regarding its ability to nurture creativity. The findings were then analyzed as themes which had been extracted from the case studies. The findings and analysis highlights that a more formal structured control system reduces the ability to exert the creativity to its fullest. Highly structured control systems are often implemented in large companies and feedback from practitioners regarding changes to better foster the creativity is absent. More flexible and open-ended control systems, which often is used in smaller companies, allows higher levels of creativity in individuals due to a lot of individual responsibilities and less guidelines to be addressed. These findings led us to the following conclusion.

Having a formal control system implemented in new product development is positive for creativity, although the effect of the dimensions that were obtained from the analysis shows that the creativity is adversely affected. Hence, this answers the research question addressed in this study.

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7   Discussion

Chapter seven present the discussion part of this study, were the topic is investigated whether it was relevant or not. This chapter provides also with a presentation of the limitations of this study, and recommendations for future studies. Furthermore, this chapter presents the managerial implications which is provided with the answer from the research question.

7.1   Relevance of topic

In the introduction of this study, a problem definition presented including a discussion about the importance of organizations to continuously innovating and developing new products, in order to be competitive and maintain a stable position in their industries. The development of innovations in this study has been categorized in two categories, discontinuous innovations and continuous innovations. Both categories of innovations require creativity, which led to the origin of this study, to investigate how these processes affects the creativity.

The problem definition describes in general two new product development processes, these processes differs in such way that the first process is formal and structured while the second process is informal and open-ended. In the literature review are we introduced to a variety of themes and patterns that shows how the processes differs, what type of leadership strategies that highlights the strategy that fits in the different processes and finally how the formal control system affects the creativity. From the literature links between leadership – creativity and formal control – leadership was identified, but there was not a clear link between formal control systems – creativity. This gap together with future recommendations of several articles written by various authors provided us with inspiration to design the research question, *"How does the structure of formal control systems affect the creativity in individuals working in NPD teams?"*.

The importance of this study comes from investigating how organizations can manage themselves and their processes in order gain a deeper understanding of how the individual creativity are affected by the organizations processes. Although the study highlights important areas that can facilitate organizations to understand their individuals, the entire

area has not yet been explored. There are still several factors that are important to highlight, this study creates a foundation for future studies.

7.2   Managerial Implications

The importance of a creative work environment in new product development is vast for organizations to be able to deliver smart and innovative solutions. Lack of individual creativity could result in poor results in companies will to be at the forefront of the development in their industries. Although this study has argued that the control system structure has an impact on individual creativity, it is also the responsibility of managers to create a work environment that fosters creativity in their subordinates. As well as fostering creativity, managers should motivate their team members to be innovative in order to reach successful results. Managers play an important role in new product development as they create conditions that raises the level of motivation and creativity, which elevates efficiency and results in organizations new product development.

This study provides valuable insights in strategic ways of structuring and developing a work environment that fosters creativity. The findings presented in this study can benefit managers of different levels, in companies of various sizes in their efforts to maximize their processes in new product development.

7.3   Limitations

Time resources has been constrained during the execution of this study. The lack of time has mostly affected the study regarding the collection of data through interviews. Only companies based in Sweden were approach as face-to-face interviews could be conducted in a time-effective manner. The selection of case companies in this study also suffered from the time constraints as the companies that were available at the time was chosen to participate. More time could possibly have resulted in stricter criteria for participation. The number of case studies and interviews is also limited due to time. We are aware of that a greater number of case studies would enrich the outcome of the study, but we are positive to that we have provided great value to a vaguely researched topic.

Another limitation throughout the study has been that the participant information has been somewhat biased. This is because that they felt reluctant to share their fully honest opinions

regarding their thoughts about their organizations and colleagues. Although they were provided a thick description of how carefully we would handle the data in order to secure privacy, anonymity and confidentiality, the participants still expressed anxiety about sharing their thoughts. A contributing factor to this could be that information about their participation was provided to us by one of their managers.

7.4 Future Research Suggestions

As this thesis only investigated how the structure of control systems in NPD are affecting the creativity of individuals that are working in innovation teams, suggestions for future research are to further look in to the topic. Research with a larger timeframe would provide valuable insights to the topic which has not yet been explored to its fullest. Another suggestion is to also study how the ability to be creative is influenced by gender, and possibly research on how the ultimate structure for fostering creativity in product management would be structured.

The finding that feedback mechanisms regarding change of practices is absent in organizations would require further research. As well as top managers and how they adapt to changes in their new product development practices.

We are confident that we have provided valuable insight in this topic and hope that it will captures the interest and attention of other researchers in the field. We think that we have successfully opened a new viewpoint on the topic and would be positive towards further research.

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9 Figure list

10   Appendix

Appendix A:

Interview structure & questions – For interviews with employees

The study

The purpose of this thesis is to investigate the impact of which the design of formal control systems as decision making tools in new product development, has on the creativity of team members in innovation teams and which types of leadership behaviors in managers that best structure the formal control system for it to foster individual creativity.

Informed consent

Informed consent is an important aspect to not cause any harm to the informants by investigating whether the benefits outweighs the risks of participating.
As taking part in this study, you will enrich the result by providing credible information by answering the questions asked in the interview. Your participation is highly valuable in order for us to complete the study in a way that it can provide answers to the discussion about New product development in the field of general management research.
The final report and the result of the study will be fully shared with you when it is completed. This is important for us so that you can see the result and importance of your participation. Notice that you always have the possibility to withdraw from the study and that the collected data in the case of withdrawal will be deleted.

Anonymity, privacy, confidentiality

To ensure anonymity regarding your participation, we will not use any personal information in the reporting of the study, such as your name or position. The location of this interview has been decided together with the participant to ensure privacy. Confidentiality is an important aspect because of the sensitive information that is related to the topic. To ensure this, no company names have been stated in the report, instead the industry and size of the company are mentioned.

Getting to know the participant

1. Who are you? (name, age, origin)
2. What is your profession?
3. How many years of experience do you have in this line of service?
4. What is your role at your current employer/company?

NPD Process

1. Tell us about your current position, what task and responsibilities you have?
2. How often do you work with NPD in teams?
3. Explain in general the structure of the process for product and innovation development at your company
4. What are the pros and cons with using that process?

Individual Impact

1. Does this process allow you to be innovative?
2. Tell us about how the process impacts your creativity when it comes to your work?
3. Tell us about how the process impacts your motivation when it comes to your work?

Manager Impact

1. To what level does your manager allow you to be part affecting the development process?
2. Explain how your manager are able to foster your creativity and motivation at work

Appendix B:

Interview structure & questions – For interviews with managers

The study

The purpose of this thesis is to investigate the impact of which the design of formal control systems as decision making tools in new product development, has on the creativity of team members in innovation teams and which types of leadership behaviors in managers that best structure the formal control system for it to foster individual creativity.

Informed consent

Informed consent is an important aspect to not cause any harm to the informants by investigating whether the benefits outweighs the risks of participating.
As taking part in this study, you will enrich the result by providing credible information by answering the questions asked in the interview. Your participation is highly valuable in order for us to complete the study in a way that it can provide answers to the discussion about New product development in the field of general management research.
The final report and the result of the study will be fully shared with you when it is completed. This is important for us so that you can see the result and importance of your participation. Notice that you always have the possibility to withdraw from the study and that the collected data in the case of withdrawal will be deleted.

Anonymity, privacy, confidentiality

To ensure anonymity regarding your participation, we will not use any personal information in the reporting of the study, such as your name or position. The location of this interview has been decided together with the participant to ensure privacy. Confidentiality is an important aspect because of the sensitive information that is related to the topic. To ensure this, no company names have been stated in the report, instead the industry and size of the company are mentioned.

Getting to know the participant

1. Who are you? (name, age, origin)
2. What is your profession?
3. How many years of experience do you have in this line of service?
4. What is your role at your current employer/company?

NPD Process

1. Tell us about your current position and what task and responsibilities you have.
2. How often do you work with NPD in teams?
3. Explain in general the structure of the process for product and innovation development at your company.
4. What are the pros and cons with using that process and structure?

Impact on Subordinates

1. Does this process allow your subordinates to be innovative?
2. Tell us about the process impacts the creativity of your subordinates?
3. Tell us about the process impacts the motivation of you subordinates?

Manager Impact

1. To which extent are you involved in deciding the structure of the development process?
2. Explain how you are able to foster the creativity and motivation in your subordinates.