



## SCHOOL OF ECONOMICS AND MANAGEMENT

# Manage your innovation

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- *A qualitative study exploring how Swedish manufacturing firms control organisational ambidexterity*

**Lund University School of Economics and Management**

MSc in Accounting & Finance

BUSN79 Degree Project

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Lund, May 2021





# Acknowledgements

We wish to express our deepest gratitude toward all participants and the ones that have contributed and supported us throughout the thesis process.

Firstly, we would like to thank our supervisor Anna Glenngård for her inspiring and challenging feedback. Her critical but supportive observations and opinions motivated us to perform our utmost.

Secondly, we would like to show our appreciation to Company X for their participation and contributions, always in a professional manner. Without their expertise, would this thesis not have been possible.

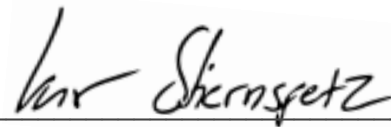
Thirdly, we wish to express our gratitude to Lund University for inspiring and challenging courses during the Master's programme.

Lastly, we would like to highlight our gratitude towards each other for an excellent collaboration during the project.



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Rebecca Petersson



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Ivar Stiernspetz

Lund, 26 May 2021

# Abstract

<b>Seminar date</b>	3 June 2021
<b>Course</b>	BUSN79 Degree Project
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<b>Five key words</b>	Management control, Simons' Levers of Control, Ambidexterity, Explorative innovation, Exploitative innovation.
<b>Purpose</b>	The study aspires to explore if and how exploitative and explorative units within the same firm require different adaptation of Management Control Systems (MCS). The study further aims to discover how Swedish manufacturing firms apply their MCS in order to steer the innovation processes in line with organisational objectives.
<b>Methodology</b>	The paper is based upon a single case study with a qualitative approach. Primary data was collected through semi-structured interviews and a questionnaire previously validated by Bedford (2015).
<b>Theoretical perspectives</b>	The theoretical framework is developed from existing theory within innovation and management control. More specifically, a view on innovation as exploitation, exploration (March, 1991) and ambidexterity (O'Reilly & Tushman, 2013), and Simons' (1994) Levers of Control (LOC) together with Adler and Borys' (1996) enabling and coercive controls.
<b>Empirical foundation</b>	The data was collected from four semi-structured interviews complemented by a questionnaire and secondary data from an annual report.
<b>Conclusion</b>	The findings of the study show that Swedish ambidextrous manufacturing firms more coercively steer exploitative activities with diagnostic controls and boundaries systems while applying more enabling control mechanisms in an explorative environment through interactive controls influenced by a beliefs system. This study further demonstrates that ambidextrous firms may balance their ambidexterity by separating units that specialise in the different types of innovation.

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# 1. Introduction

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*The following chapter provides an introduction to the topic of innovation and management control. This is followed by a problem discussion and the purpose of the study. Lastly, the research question that the paper aspires to answer is defined, followed by definitions.*

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## 1.1 Background

For companies to simultaneously meet the current demand and maintain competitiveness in the long-term perspective, it is essential to exploit existing processes and explore new opportunities (March, 1991; O'Reilly & Tushman, 2013). Both exploitative and explorative activities are types of innovation firms perform to develop their business. Management Control Systems (MCS) is a common phenomenon affecting firms' innovation processes (Davila, 2005) and can be described as "*those systems, rules, practices, values and other activities management put in place in order to direct employee behaviour*" (Malmi & Brown, 2008, p. 290). Historically, research has argued that MCS have harmed organisations' innovation processes since it is commonly associated with strict guidelines and clear boundaries (Ouchi, 1979; Davila, 2005). On the other hand, more modern research highlights the customisation of MCS to manage innovation effectively. In other words, depending on which type of innovation that the unit or organisation practices, the MCS should accordingly be adjusted to enhance performance (O'Reilly & Tushman, 2013; Bedford, 2015).

Exploitative and explorative activities are types of innovation important to distinguish when applying the MCS. Exploitative activities refer to developing existing products and processes, meanwhile explorative activities include discovering new processes and opportunities (March, 1991). Exploitative activities have the purpose of improving and smoothen current operations, in other words, improving processes of current operations. Contrary, the practice of explorative activities involves searching for uncharted solutions and demands, more specifically, researching and investigating new processes. The combined utilisation of exploitation and exploration is referred to as organisational ambidexterity which occurs when a firm performs both activities simultaneously. Furthermore, depending on how the firm decides to administer its resources

among exploitative and explorative activities, the characteristics of the ambidexterity vary (O'Reilly & Tushman, 2013).

Nowadays, research argues that MCS is essential for encouraging innovation rather than constraining it (Davila, 2005; Bedford, 2015). Hausteine, Luther and Schuster (2014) discuss how various contingency factors may impact the customisation of the MCS. External factors, organisational characteristics and innovation-related characteristics are all contingency factors affecting the construction of the MCS (Hausteine, Luther & Schuster, 2014). Consequently, firms operating in more stable environments tend to benefit from utilising existing knowledge and technologies that are more controlled with coercive control mechanisms. On the other hand, firms that operate in uncertain and fluctuating conditions rather benefit from discovering new possibilities steered by an enabling control system (Adler & Borys, 1996; Benner & Tushman, 2003). Thereby, various types of innovation need to be differently controlled since innovation does not occur in isolation. Rather, innovation and the MCS are dependent on each other (Bedford, 2015).

## 1.2 Problematisation

Organisational ambidexterity is commonly argued to positively impact performance (Gibson & Birkinshaw, 2004; Lubatkin, Simsek, Ling & Veiga, 2006; O'Reilly & Tushman, 2013). However, there is research arguing that there exist other solutions than solely organisational ambidexterity for long-term survival. Gupta, Smith and Shalley (2006) highlight punctuated equilibrium as another activity for balancing exploitation and exploration. Instead of a simultaneous utilisation, the organisation has its focal point on exploitation during longer cyclical periods and performs short-term sequential actions of exploration. Non-simultaneous performance of exploitative and explorative activities is also referred to as sequential ambidexterity, in other words, the activities occur in sequences rather than simultaneously (O'Reilly & Tushman, 2013). Nonetheless, an exclusion of explorative activities has the potential to increase the risk for unbalance, leading to short-term focus. Meanwhile, the trade-off of solely focusing on explorative activities can expose the organisation for a vulnerable cash flow leading to that the benefits of exploration cannot be utilised (March, 1991).



One may then wonder how a company can balance the resources to achieve desired organisational ambidexterity? There are various contingency factors that impact the interplay between exploitation and exploration (O'Reilly & Tushman, 2013; Haustein, Luther & Schuster, 2014; Bedford, 2015). An organisation operating in a more stable and mature environment may benefit from centring its focal point more on exploitative activities, while firms in more uncertain conditions can be favoured from more explorative activities. However, research argues that the constant ability to perform exploitation and exploration simultaneously is essential to maintain long-term survival even if the relationship can vary (O'Reilly & Tushman, 2013; Bedford, 2015). At the same time, as contingency factors affect the relationship between exploitation and exploration, the MCS need to be effectively adapted (Haustein, Luther & Schuster, 2014; Bedford, 2015). Bedford's (2015) application of Simon's (1994) lever of control (LOC) framework illustrates how an organisation's MCS can be customised aligned with the innovation strategy. However, there is no best MCS (Haustein, Luther & Schuster, 2014) nor perfect applicable control lever of innovation (Bedford, 2015). Instead, a combination of control levers suitable for the organisation's interplay of exploitation and exploration is vital. More enabling controls encourage explorative innovation activities while coercive control mechanisms enhance performance for exploitative activities. Thus, since various control factors impact the innovation process differently, combinations are required. Companies that perform organisational ambidexterity benefit from the combined use of interactive and diagnostic control levers (Bedford, 2015).

Bedford's (2015) quantitative research upon Australian firms investigates how to align different types of innovation with the organisational objectives by combining control levers. Although research has touched upon the dynamic relationship between the MCS and innovation, it has not been qualitatively studied to our knowledge. To be more specific, there seems to be a lack of empirical research on the area of ambidextrous firms' use of MCS to control exploitative and explorative activities. Additionally, current research describing the relationship between ambidexterity and combinations of levers of control is geographically narrowed. Finally, the importance of suitable control mechanisms in relation to innovative activities is an ongoing topic relevant for further and updated knowledge.

### 1.3 Purpose and research question

The purpose of the following paper is to add to the existing research on the relationship between MCS and innovation by further research upon Bedford's (2015) combination of levers within ambidextrous firms. The study aspires to explore if and how exploitative and explorative units within the same firm require different adaptation of MCS. The study further aims to discover how Swedish manufacturing firms apply their MCS in order to steer the innovation processes in line with organisational objectives. This leads to the following research question:

1. How does the management control vary depending on the type of innovation within an ambidextrous firm?

### 1.4 Definitions

#### **Exploitation**

Organisations' development of existing processes, products and services based upon existing knowledge (March, 1991; O'Reilly & Tushman, 2013). Also referred to as exploitative activities.

#### **Exploration**

Organisations' development and discovery of new processes, products and services (March, 1991; O'Reilly & Tushman, 2013). Also referred to as explorative activities.

#### **Ambidexterity**

The simultaneous performance of exploitation and exploration (O'Reilly & Tushman, 2013). Also known as organizational ambidexterity. Henceforth, when writing ambidexterity in this thesis, we are referring to organizational ambidexterity if nothing else is stated.

#### **Ambidextrous firms**

Firms perform both exploitative and explorative activities.

#### **Types of innovation**

In this study, types of innovation are limited to exploitation and exploration as types of innovation.

**Management Control (MC)**

Management's methods, practices and processes for steering and controlling the employees in the desirable direction of the organisation (Otley, Broadbent & Berry, 1995; Merchant & Van der Stede, 2007; Malmi & Brown, 2008).

**Management Control System (MCS)**

The management control tools have interdependent relationships and are systemised according to their interdependencies (Grabner & Moers, 2013).

## 2.0 Literature review

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*In the following chapter, the method for collecting literature is presented. Moreover, exploitation, exploration, and ambidexterity are defined and explained, followed by management control's evolution, ending up in Simons' Levers of Control. Finally, a conceptual framework is presented based upon the existing literature.*

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### 2.1 Method for collecting literature

To increase awareness of the research area, the authors examined and scanned existing literature. The academic databases *Scopus* and *Google Scholar* were primarily used together with *LUBsearch Lund University Libraries* in order to collect peer-reviewed literature from relevant journals. Using the keywords; *Management control, Innovation, Exploration, Exploitation and Ambidexterity*, the authors scanned and analysed article abstracts and summaries. Additionally, criteria regarding the number of citations, credibility of the journal, and whether the article was supported by other research were established to provide a high-quality frame of reference. For further credibility of the journals, the *Academic Journal Guide by Chartered ABS* was used. The authors aimed to use journals with a grade of three or higher according to the ABS list. In few cases when this was not fulfilled, a strong emphasis was placed on the number of citations and support by other research. Lastly, the authors aspired to collect and employ the most recent literature to generate an updated comprehension of the research field.

### 2.2 Types of innovation

Innovation has become an extensive research topic, and it has developed into narrowed categories (Birkinshaw, Hamel & Mol, 2008). Pisano's (1997) process innovation, Teece's (1986) technology innovation, and Gallouj and Weistein's (1997) service innovation are evidence and examples of various categories within the innovation area. However, a general agreement among the different categories of innovation is that the process of adapting and implementing something new includes uncertainty (Teece, 1986; Gallouj & Weinstein, 1997; Pisano, 1997). An idea of something new or unique that is not tested in practice refers to an invention. It is the later attempts of

commercialising or practising the idea that refers to innovation. Thereby, there are generally significant time gaps between the invention and the innovation since the latter commonly requires resources and expertise to be commercialised (Fagerberg, 2006).

Research demonstrates that substantial amounts of inventions are not commercialised due to various types of barriers, such as the lack of resources and expertise, and that the technical infrastructure is not developed enough to support the idea (Fagerberg, 2006; Kline & Rosenberg, 2010). Nonetheless, innovation necessarily does not solely imply a unique product or idea that is supposed to transform the environment, rather and more commonly, innovations symbolise the development of new processes, new types of material and advanced methods for accomplishing tasks. In fact, research argues that process innovations are mainly the innovations contributing to financial performance for companies that produce and manufacture goods (Kline & Rosenberg, 2010). For that reason, firms commonly focus on improving existing products and targeting the markets with the greatest demand and highest profitable customers, which leaves room for new entrants with more disruptive innovations. Thus, there is a potential risk for the incumbents of losing customers if the innovation the entrants possess proves successful (Christensen, Raynor & McDonald, 2015). Hence, researchers argue that there are two general types of innovation that organisations may perform simultaneously in order to maintain their competitive position and survive in the long-term perspective, namely, exploitative and explorative activities (March, 1991; O'Reilly & Tushman, 2013). The combination of exploitation and exploration, which refers to ambidexterity, tends to enhance the firm's performance (Gibson & Birkinshaw, 2004; Lubatkin et al. 2006; O'Reilly & Tushman, 2013).

### 2.2.1 Exploitation, Exploration, and Ambidexterity

Exploitation broadly implies the improvement and extended knowledge of existing processes. In other words, firms that perform exploitation aim to capitalise on existing routines and expertise. Contrary, exploration refers to the processes where an organisation search, discover, experiment and research for new products, processes, services and markets. Firms that acclimate exploration intend to benefit from discovering new practices beyond current knowledge. However, firms focusing more solely on explorative activities and excluding exploitative activities tend to be financially exhausted. Explorative activities characterise being more uncertain and tend to

interrupt short-term financial targets. On the other hand, exploitative activities are more predictable where the period between action and result is shorter. However, firms that entirely put resources on exploitative activities increase the risks of being inflexible and later suffer from needing excessive time to adjust to the market demand in the long-run perspective (March, 1991). Thus, in the nowadays dynamic environment is a combined and simultaneous performance of exploitative and explorative activities of relevance for long-term survival, also referred to as organisational ambidexterity (March, 1991; O'Reilly & Tushman, 2013).

Organisational ambidexterity enables firms to compete with two different perspectives, however, since exploitation and exploration compete for the same resources in an antagonistic manner, there is a challenge of balancing the two (Luger, Raisch, & Schimmer, 2018). In order to counter these contradicting forces between exploitation and exploration, researchers have identified that firms sequentially apply exploitative and explorative activities (Gupta, Smith & Shalley, 2006); Bedford, 2015). However, sequential ambidexterity has been criticised for being ineffective in dynamic environments, while organisational ambidexterity can better respond and adjust to changes (O'Reilly & Tushman, 2013). Another form highlighted by research to balance exploitation and exploration is specialising units adapting either exploitation or exploration (Benner & Tushman, 2003). Separating the ambidexterity in different subunits enables the organisation to simultaneously innovate processes in different angles, meanwhile the subunits can be committed to solely focus on either exploitation or exploration (Stettner & Lavie, 2014). As described, the two types of innovation, exploitation and exploration, are necessary for firms' long-term survival and competitiveness (March, 1991; O'Reilly & Tushman, 2013). However, they require to be controlled differently to be successful (Bedford, 2015).

### 2.3 The evolvement of Management Control

Management Control (MC), which is an established field within the accounting and management research, can be described as methods for steering all participants in the desirable direction of the organisation (Otley, Broadbent, & Berry, 1995; Merchant & Van der Stede, 2007; Malmi & Brown, 2008). The traditional adaption of MC commonly consisted of cybernetic control mechanisms countered with reactive processes, in other words, a task or operation was compared with the standard performance and was subsequently responded with action from the management.

Nowadays, the MC processes function more proactively to secure, or at least increase, the likelihood that performance and behaviour align with the organisational objectives. The proactive characteristics of MC contributed that more informal control mechanisms were included, which later generated the term Management Control System (MCS) (Merchant & Van der Stede, 2007). Ouchi's (1979) clan control was among the firsts MCS with informal control mechanisms where beliefs systems and shared norms were highlighted to construct a common culture focusing on mutual targets. More recently, research observes different contingency factors affecting the MCS, which is appropriate to consider in the application process of the control mechanisms (Haustein, Luther & Schuster, 2014). Adler and Borys' (1996) coercive and enabling control mechanisms illustrate that different control tools are appropriate depending on the business and its environment. Coercive control is discussed to be of more relevance to apply in more routine based environments with relatively standardised tasks steered by cybernetic mechanisms, whereas enabling control mechanisms suits more complex operations in dynamic environments (Adler & Borys, 1996; Ahrens & Chapman, 2004).

Similar to coercive and enabling control, Simons (1994) elaborates how various levers of control are appropriate for organisations operating in different environments. Nonetheless, since there are rarely found organisations that purely operate in a narrowed and specific environment, research argues that combinations of formal and informal control mechanisms are appropriate (Ahrens & Chapman 2004, Bedford, 2015). Consequently, Malmi and Brown's (2008) MCS as a package serves as an overview of how different control tools, both formal and informal, have the potential to link with each other. However, Grabner and Moers (2013) highlight the importance of distinguishing between MC as a package and as a system. MC as a system signifies that interdependencies exist between the control tools, customised to the contingent factors of the organisation. Contrary, MC as a package symbolises the control tools utilised by the organisation, regardless of the relationship between them (Grabner & Moers, 2013). Hence, even if there is no commonly agreed definition of MC (Merchant & Van der Stede, 2007), researchers share the view that MC does not work in isolation, instead it is dependent on various contingencies which should affect its construction and systematisation (Otley, 1980; Adler & Borys, 1996; Malmi & Brown, 2008).

### 2.3.1 Simons' Levers of Control

Firms utilise different control systems depending on their strategy and competing environment (Simons, 1987) but also depending on how the top managers practice their MC (Simons, 1991). Strategy refers to the formalisation of the required and anticipated work to achieve decided goals and targets. However, Simons (1990) highlights that the MCS has not solely the purpose to monitor activities and behaviour within the organisation but also the responsibility to encourage the organisation to be adequately informed of strategic uncertainties and enhance the decision-making for top managers (Simons, 1991). Since firms have various strategies, developed by different managers, Simons (1994) constructed four types of MCS depending on the two contingency factors; strategy and use of management. However, to fully comprehend the four different designs of the MCSs, also referred to as Simons Levers of Control (LOC), is it of relevance to state and later clarify the meaning of Simons' (1987) MCS definition: "*The formal, information-based routines and procedures used by managers to maintain or alter patterns in organisational activities*" (Simons, 1987, p.170). The formal routines symbolise, for instance, the budgeting and planning processes. Information-based routines explain that managers use information as the foundation for their decision-making, communication, and performance evaluation. Hence, information works as a control tool for management to develop and steer organisational behaviour. The four categories of MCS are; Beliefs systems, Boundary systems, Diagnostic control systems, Interactive control systems (Simons, 1994).

#### **Diagnostic control systems**

Diagnostic control systems have the purpose of overseeing and controlling organisational performance. The facial characteristics of the diagnostic control system are its ability to estimate and evaluate the performing results, compare actual performance with expectations, and the ability to respond to the deviations to meet the standards. Periodically measuring machines, employees, and performance flows enables the organisation to provide feedback, quality improvements and additional adjustments to tighten the gap between actual and predetermined targets. In more detail, the diagnostic control system contains key performance indicators (KPIs) that are required to be accomplished in order to achieve the strategy. Thereby, the organisation's strategy must be determined before the diagnostic control system can be implemented and, subsequently, decide which performance indicators to include to overcome the strategy (Simons, 1994).



The measurements of the diagnostic control systems can be both quantitative and qualitative measures formalised in different scales. The measurements can be in nominal scales, such as the quantity of produced cars, or ordinal scales, for instance, if the company is ranked as the second safest car manufacturer, or in a ratio scale, such as how large the market share is in Europe. Moreover, the measures planned to monitor must be objective, complete, and responsive in order to be effectively utilised. Objective measures are required to be independently confirmable and are straightforward of what results that are expected. The measure is complete if it includes all essential behaviours and performances in order to meet the target. For the measure to be responsive, it must be feasible to measure the exertion of the individual or activity. Thereby, a diagnostic control system is not relevant for strategies where precise data cannot be compiled. For instance, in research laboratories where unique and new information develops, it is commonly more complex to respond and correct such operations. Contrary, for a manufacturing firm where objective market surveys can be employed, and complete financial measures can be utilised, and where the individuals' effort can be evaluated, diagnostic control systems may be more relevant (Simons, 1994).

The motivation of the employees is a crucial factor in order to achieve the goals established. Therefore, it is essential to determine the goals to consider how goal setting affects the motivation for the employees. If the goal is perceived to be remarkably difficult or overwhelming to accomplish, this will have a negative impact on the employees' motivation. Simultaneously, if the target is perceived to be immensely easy to overcome reduces the motivation likewise. Consequently, expected targets must be relevant to stimulate the employees' willingness to accomplish the target at an accurate level (Simons, 1994).

Diagnostic control systems can also contain dysfunctional side-effects leading to a less effective control system. To specify, if not relevant measures are implemented, it can affect the organisational behaviour in another direction than the specified strategy. Furthermore, the system also has the risk of being manipulated by employees in order to reduce the effort needed to achieve the targets. Participants of the organisation may also be biased and collect data in their favour to receive more rewards and bonuses, which will probably harm the overall performance. In order to reduce the risk of the negative side-effects of the control system, organisations can work

proactively with internal control systems and with specialised staff groups. Since diagnostic control systems work effectively when the measures are accurate, those controlling activities are crucial. The diagnostic control system is, thereby, a feedback system for controlling that the organisation's performances are in line with the formalised strategy. The various measurements must be relevant and accurate in order to be value-creating. The continual improvements during the organisational growth lead to higher standards and expectations are set, moving the organisation forward (Simons, 1994).

### **Interactive control systems**

Contrary to diagnostic control systems that narrow and limit opportunity-seeking, interactive control systems encourage creative and explorative processes. The encouragement of creating and finding new ideas prevails throughout the entire organisation in order to respond to opportunities and threats. Threats in terms of a competing environment work as a major stimulus and hence, pushes organisations to innovate and adapt their processes. For an organisation to encounter such pressure from competitors, it is crucial for the management to embolden participants within the organisation to think outside the box and explore beyond the traditional boundaries. Additionally, information considering abrupt and critical changes of the environments requires to be shared internally between departments to support a creative mindset at all levels of the organisation (Simons, 1994).

For managers to communicate and stimulate the organisation in the creative processes, the top leaders must be aware of the existing strategic uncertainties. Strategic uncertainties consider the risks and threats that have the potential to harm or constrain the business' strategy. Interactive control systems have four main characteristics describing the control system. Firstly, analysis of the data and information flow throughout the organisation is an iterative process by the top management. Secondly, the interactive control system expects and requires constant awareness from operating managers about processes and behaviour. Thirdly, the information flows are discussed in regular face-to-face meetings, including top management, operating managers and subordinates. Finally, the data collected within the organisation encourages debates and discussions regarding potential solutions, action plans and opportunities to encounter organisational challenges. Thereby, the foundation of interactive control systems relies on the frequent involvement of management within subordinates' decisions and daily activities. The

interactive processes with subordinates include, for instance, frequent meetings of advanced technology and or information about competitors leading (Simons, 1994).

It is the collection of data and information combined with the communication throughout the organisation that the decisions of new ideas and opportunities are based upon. Successful action plans and ideas will later be developed and repeated, whereas the strategy can be adjusted in line with the new opportunities. Hence, interactive control systems stimulate and encourage the autonomous thinking of various levels within the organisation to constantly have attention for opportunities beyond the current business strategy. The wide organisational attention and opportunity-seeking are later communicated through the interactive processes leading to new strategy visions by the top management. For organisations to enhance the encouragement of innovation and opportunity-seeking are subjective contribution rewards utilised. Since it is complex to decide to what extent an idea or contribution has been generated, the management's judgement decides if the contribution should be rewarded or not. Rewarding contributions in reverse to results have the potential to enhance organisational learning. However, it is essential that the decision-taker of the reward comprehend the business deeply in order for the reward system to operate effectively (Simons, 1994).

Regarding the design of the interactive control system, five fundamental characteristics are depicting the system. Firstly, the organisation reformulates and re-forecast previously stated decisions due to new circumstances that have evolved. The new data should detect and warn for new patterns that the afterwards interactive discussions base new decisions upon. The comprehension of new information contributes to new action plans taken. Secondly, the data and information flow must be easy to comprehend to work as a source for new decision-making. For instance, updated information of current market-share is information easy to understand. High technological information that only can be comprehended by experts is not appropriate for the interactive control system. The third required condition regards the involvement of various organisational levels. Fourthly, when the new patterns are understandable must action plans be allowed to be adjusted in order to encounter the newly received information. Finally, for the system to be utilised interactively, the system requires that the systems respond to the organisation's unique environmental uncertainties. In order words, the information that is constantly collected must be relevant for the organisation's contingencies (Simons, 1994).

There are, as with other control systems, risks associated with interactive control systems. Participants may identify irrelevant environmental uncertainties, which leads to inaccurate information being collected, discussed and later used for decisions. Scoping insufficient or inaccurate information may lead to other opportunities being missed out. Additionally, the interactive processes have the risk of not being diversified enough, but also the communication has the risk of being inadequate (Simons, 1994).

### **Beliefs systems**

Firms are constructed for a purpose, with a shared aspiration to fulfil that purpose. Along with the firm's development, the essentialness for communicating this purpose increases in order to keep the organisation unified. The beliefs system corresponds to the formalised core values and beliefs that the high-level executives communicate toward the lower-level employees to unite and guide the organisation in the same direction. Beliefs systems are conducted through formal information-based documents and published in, for instance, mission statements or credos. However, the shared comprehension of the core values comes from the discussions rather than the construction of formal documentation. Documents should be; formal, information-based and used by management to preserve or revise organisational activities to be characterised as part of the beliefs system. Nonetheless, the main objective of the beliefs system is the generation of motivational encouragement for the attendants. More specifically, beliefs systems enhance the employees' motivation to be more solution-oriented when confronted with problems and complex tasks, resulting in new methods and possibilities for enhancing value. Core values and their symbolic use work as triggers for the employees' intrinsic motivation to perform their individual tasks in line with the organisational purpose. Hence, the communication of beliefs systems has the ability to produce a shared symbolic vision that stimulates attendants' commitment to solve tasks and achieve organisational goals (Simons, 1994).

The need for and importance of beliefs systems has increased due to the development of business. The clear purpose of producing and offering a product to meet a specific demand has become more complex and uncertain. Together with the globalisation, continuous development of technology and the growth and expansions of businesses, the importance of a clear purpose and values communicated throughout the organisation has increased. It has become essential for top

management to create and communicate strong fundamental values in order to ensure organisational stability in a changing and challenging environment. Additionally, employees generally perform better if they are committed to the firm and share its beliefs. Therefore, beliefs systems are important to increase employees' commitment and willingness to achieve organisational goals (Simons, 1994).

### **Boundary systems**

Contrary to the belief systems that encourage employees to explore possibilities, boundary systems have the purpose of limiting and constraining employees' options. In other words, beliefs systems are perceived as positive systems, stimulating exploratory behaviours, while boundary systems are constructed as a negative system, restricting employees from searching for opportunities outside their boundaries. Boundary systems are formal systems constructed by management required for the employees to follow. The system includes, for instance, commanding behaviours, code of conduct and managerial directives of what employees should not attempt to do. Boundary systems aim to designate how employees should carry out their tasks in order to avoid risks and occurrences outside existing knowledge. To specify, the management relies on the individual exploration and capacity within the stated boundaries to effectively drive the organisation forward. Hence, boundary systems do not necessarily limit individuals' creativity, rather it defines the area where creativity is allowed to prosper. Evidence shows that rewards for not breaking the boundaries are not useful, instead, for the system to work effectively, reasonable sanctions for infringing the boundaries are more relevant (Simons, 1994).

Simons (1994) further explains two types of formal boundary systems, namely, Business Conduct Boundaries and Strategic boundaries. Business conduct boundaries characterise with a clear code of conduct to mitigate individual behaviour and judgment outside the business boundaries. Business conduct boundaries are commonly created either when the business environment is uncertain or when the performance of the business is constrained. Thereby, when the organisational uncertainty increases or when the shared expertise of the organisational direction is low, more rules and restrictions are implemented in order to mitigate the risk that explorative actions are taken or that activities are made in a self-interested manner. However, there is also a risk that the implementation of more boundaries limit and constrain the organisation's development and miss out on opportunities that could be value-creating. Additionally, managers commonly

misuse the implementation of a code of conduct. For instance, managers tend to implement the boundary after the undesired behaviour or action in a reactive manner instead of using it as a proactive approach. Strategic boundaries, on the other hand, have their focal point to guide the explorative activities of the organisation. To specify, strategic boundaries intend to limit the exploratory activities and state what activities are not acceptable. In other words, strategic boundaries are set in order to narrow the opportunity-seeking processes for the organisation to make the explorative activities more effective. Explorative activities commonly require significant resources, thereby, if employees focus on inappropriate or inaccurate tasks that are not in line with the organisation’s strategy, major losses may occur. Nevertheless, similar to business conduct boundaries, managers tend to implement strategic boundaries after undesired actions have occurred (Simons, 1994).

## 2.4 Conceptual Framework

A conceptual framework has been constructed based on existing literature derived from Adler and Borys’ (1996) enabling and coercive control and Simons’ (1994) levers of control. The collected research indicates that the MCS should be customised in accordance with March’s (1991) types of innovation, exploitation and exploration. O’Reilly and Tushman (2013) define the type of innovation as ambidexterity when exploitation and exploration are simultaneously performed. Exploitative activities that commonly involve routine-based tasks in familiar environments are assumed to be controlled by coercive control mechanisms, including diagnostic and boundary systems. Contrary, explorative activities that include complex tasks in more uncertain environments should be facilitated by enabling control mechanisms influenced by interactive controls and beliefs systems.

<b>Type of innovation</b>	<b>Ambidexterity</b>			
	<b>Exploitation</b>		<b>Exploration</b>	
<b>Type of MC</b>	<b>Boundary</b>	<b>Diagnostic</b>	<b>Interactive</b>	<b>Beliefs</b>
	<b>Coercive</b>		<b>Enabling</b>	

Figure 1: Conceptual framework (Pettersson & Stiernspetz, 2021)

## 3.0 Methodology and Method

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*In the third chapter, the methodology, including the research approach of the study, is presented. Further, the selected method for the study is described, followed by the case selection and data collection. Lastly, ethical and quality considerations are elaborated.*

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### 3.1 Methodology

As the study is exploratory in its nature, a qualitative research approach was chosen (Easterby-Smith, Thorpe & Jackson, 2015). Qualitative research is of relevance with its capability to conceptualise the research problem through interviews with open-ended questions (Saunders, Lewis, & Thornhill, 2007). Since the paper aspired to construct a deeper understanding of the topic based upon existing research, a single case study was seen as appropriate (Yin, 2014).

#### 3.1.1 Research design

A qualitative research approach was seen as suitable since the ambition was to construct a profound understanding of how ambidextrous firms apply their MCS to steer their innovation processes in line with organisational objectives. In other words, the qualitative research approach with semi-structured interviews, characterised by its non-numeric practices, enabled us to observe answers in a contextualised manner (Easterby-Smith, Thorpe & Jackson, 2015). Qualitative research can be designed in various ways, however, since the purpose of the study is of exploratory nature formulated with a how question, a case study was seen most appropriate (Saunders, Lewis, & Thornhill, 2007; Yin, 2014). To prevent the study from solely creating a generalising and holistic view of the research field, which could be the case with few interviews in multiple cases, we chose to do a single case study accompanied by several semi-structured interviews. The application of a single case study enabled information to be collected from different subunits of the company, also referred to as an embedded single case study (Yin, 2014). To accomplish the purpose of the study, information from all different innovation types, exploitative, explorative, and ambidextrous activities, where required. Thus, the application of an embedded single case study was seen as the most suitable option since it maximised the access of relevant information in relation to the

literature. Although a multiple case study has the ability to strengthen the broad comprehension of the research field, the embedded single case study complemented our aspiration of extending the research and enhancing the knowledge within the field of innovation and MCS (Yin, 2014).

## 3.2 Method

The study aims to investigate the research question within a specified area, namely, ambidextrous firms within the Swedish manufacturing industry. Data was collected primarily through four semi-structured interviews within the company's R&D division. Moreover, the data was complemented with a questionnaire to specify each unit's type of innovation. Secondary data was collected from the company's annual report (2020) to complement the information regarding culture and core values. A thematic analysis approach was applied to sort and explore the data in relation to the conceptual framework.

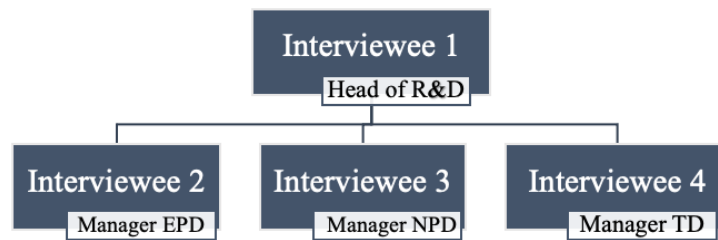
### 3.2.1 Case selection and sampling method

A non-probability sample method was adapted in order to collect information from a relevant organisation with particular knowledge of the chosen topic (Creswell, 2007). The selected purposeful sample method is commonly used within qualitative research since it enables the researchers to access accurate information relevant for the purpose (Creswell, 2007; Bell, Bryman, & Harley, 2019).

In order to sort out irrelevant organisations and to narrow the field of potential participating organisations, an eligibility criterion was constructed. The prerequisites included five criteria; industry, the requirement for being an ambidextrous firm, at least 1 000 employees, stock listed and, more than one billion SEK in turnover. The criteria were proactively determined for the collection of information to be credible, reliable and trustworthy (Longhurst, 2010). The case of the study, referred to as *Company X* due to a confidentiality agreement, is a public corporation listed on Nasdaq Stockholm. Company X is a multinational corporation that operates in the manufacturing industry and has more than 15 000 employees with tens of billions in annual turnover. Post the selection of the case, together with the company, we identified relevant individuals for the study in order to access the proposed knowledge. The criteria for chosen



individuals were top management within a specific division of the company. To specify, the authors requested interviews with the Head of R&D, the manager for an exploitative unit, the manager of an explorative unit, and the manager of an ambidextrous unit. The scrupulous selection of interviewees aimed to enhance the probability of appropriate answers for the research question. The manager for the Existing Product Development (EPD), refers to the responsible manager for the exploitative unit. The manager for the Technology Development (TD) refers to the responsible manager for the explorative unit. The manager for the New Product Development (NPD) refers to the responsible manager for the ambidextrous unit.



*Figure 2: Illustration of the organisational structure of the interviewees*

### 3.2.2 Data collection

The collected primary data enabled the answers to be observed in a real-world context that otherwise would have been difficult to explore. In line with Easterby-Smith, Thorpe and Jackson (2015), the purpose of the study was discussed with and clearly explained to the interviewees in order to assure their comprehension of the topic. Firstly, we introduced the topic and purpose of the study to the company's Vice President of Business Control for a subdivision of the company. After a deeper clarification of the topic, we were directed to the Head of R&D for the largest division of the corporation to access pertinent expertise relevant to the research question. Subsequently, scrupulous interview preparations took place to ensure an accurate interview design. The selection of semi-structured interviews with open-ended questions enabled a more flexible interview method compared to structured interviews. Additionally, the semi-structured interviews enabled the interviewees to respond in a more personal manner and fully express their view, which facilitated the researchers' opportunities to conceptualise the research issue (Easterby-Smith, Thorpe & Jackson, 2015). In total, four interviews were carried out, whereas the first interview with the Head of R&D generated a broad overview and the interviews with the subunit managers

engendered a more profound understanding. All interviews combined created a greater connotation and led to cumulative knowledge (Yin, 2013).

Beyond composing interviews for obtaining primary data, the researchers composed a questionnaire sent to the Head of R&D in order to grade and define the extent of exploitation and exploration for each subunit. The questionnaire contained eight questions, four specifying the extent of exploitative activities and four specifying the extent of explorative activities. This enabled us to construct our *Innovation scale* where a higher score indicates more explorative activities, contrary, a lower score indicates more exploitative activities. The respondent was asked to grade each unit from 1-10 in the eight questions (Appendix 1). The scores from the eight questions were summarised, and an average was calculated. The score from the four exploitation questions was subtracted from 10 in order to get the high exploitation score as a low score on our innovation scale. In other words, the formula for the exploitation questions' score was:  $10 - \text{answer} = \text{score}$  (Appendix 2). To specify, the questionnaire enabled a grade scale to define which subunit belonged to what innovation type and to what extent. Thus, the activity contributed to a possible categorisation of each subunit to either be; Exploitation unit, Exploration unit, Ambidextrous unit. The utilised questionnaire originated from Bedford's (2015) study in order to assure credibility.

### 3.2.3 Interview design

Semi-structured interviews were seen as appropriate for the explorative design of the study. The open-ended questions enabled flexibility during the interviews, for instance, the semi-structured interview method allowed us to ask follow-up questions where the respondents could clarify their answer. Additionally, the follow-up questions mitigated the risk for the respondent to misunderstand the question (Easterby-Smith, Thorpe & Jackson, 2015; Rennstam & Wästerfors, 2018). Furthermore, the method enabled comparisons among the different units since the interviews contained the same questions asked in similar order (McIntosh & Morse, 2015). Contrary to structured interviews, which contain a predetermined list of identical questions without flexibility, the semi-structured interviews enabled more interactions dependent on the situation, which contributed to a more detailed understanding essential for the purpose (Saunders, Lewis & Thornhill, 2007).

The following interview guide (Table 1) is derived from the conceptual framework in order to answer the research question, covering the management control part. Together with the questionnaire that collected data about what kind of innovation type the unit practice, we covered the fields of our conceptual framework. In order for us to understand which innovation activities the unit practices, the interviews started with a presentation of the unit's operations. Thus, the questionnaire provided quantitative results to specify the innovation type, while the interview described these in a qualitative manner. The interview guide (Table 1) illustrates a sample of the interview questions with follow up questions. See Appendix 3 for all questions.

Categories		Sub-categories	Interview question	Situational follow-up question
Simons LOC	Coercive	Diagnostic control system	(1) How do you observe the performance of your unit? (2) How does the unit utilise budgets and or performance measures?	(2) Can you give examples how these budgets and measures influence the activities? (2) Do you use these measures and budgets to follow up the outcomes, if so, how?
		Boundary System	(3) Do you have stated guidelines or code of conducts how to behave and act? (4) How do you control where exploratory activities are performed and how are these communicated? (5) How does management communicate what risks the employees should avoid?	(3) How are these guidelines communicated? (4) What kind of purpose does these controls have?
	Enabling	Interactive control system	(6) How does the managers encourage employees to search for new information beyond existing expertise? (7) How is information about changes that affect the operation shared internally? (8) How does your unit predict uncertainties or future risks?	(6) How is the employee aware of that? (7) If new action plans take place based upon that information, how does the decision-making look like?
		Belief System	(9) How are visions, core values and goals utilised within your unit? (10) What impact have visions, core values and goals on the unit?	(9) How are these communicated? (10) How can these visions, core values and goals affect the motivation of the employee?

Table 1: Interview guide

All four interviews were conducted through Microsoft Teams in a video call format with both authors present. The participation of both authors mitigated the risk of not capturing all relevant information but also contributed to an enhanced understanding of the analysis work. In other

words, the comprehension of the interviews was less biased due to the participation of both authors. All interviews started with presenting the topic to assure the interviewee's understanding, followed by the interview questions. Due to the interviews' arrangements, one of the authors steered the interview while the other acted as support to avoid interruptions. Thus, the arrangement enabled the supporting interviewer to analyse the data during the interview in a contextual manner.

<b>Interview</b>	<b>Role</b>	<b>Educational background</b>	<b>Date of interview</b>	<b>Duration</b>	<b>Interview Format</b>
1	Head of R&D	M.Sc. Chem. Eng	09-04-2021	43 min	Microsoft Teams Video Conference
2	Manager Existing Product Development	B.Sc. Eng	20-04-2021	48 min	Microsoft Teams Video Conference
3	Manager New Product Development	M.Sc. Mech. Eng	21-04-2021	46 min	Microsoft Teams Video Conference
4	Manager Technology Development	M.Sc. Mech. Eng	22-04-2021	42 min	Microsoft Teams Video Conference

*Table 2: Interview overview*

### 3.2.4 Data analysis

The analysis of the interviews started simultaneously as the interviews occurred, which is in line with Rennstam and Wästerfors (2018). For instance, we let the interviewee freely respond, explain and express their views, however, we sometimes distilled the respondents' explanations and gave them the opportunity to confirm, deny, and clarify their answer. The distilling procedure clarified the answers, which simplified the later analysis work (Rennstam & Wästerfors, 2018). Furthermore, all interviews were recorded and shortly after transcribed to mitigate the risk of losing relevant data and enhance the analysis process (Saunders, Lewis & Thornhill, 2007). The recorded and transcribed material was essential during the coding process of the interviews since it enabled the analysis to be iterative.

Our discussions enabled interpretations of the empirical findings, in other words, our theoretical knowledge constructed conceptualisations beyond common sense from the transcribed material (Rennstam & Wästerfors, 2018). Silverman (2013), however, argues that all information from interviews cannot directly reflect real-life since quotes are affected by what has been said before and what information that is expected to be said. To mitigate those risks of realising insignificant quotes that do not symbolise a deeper meaning, the general interview with the Head of R&D was helpful in order to guide and clarify what quotes that were of reason to contextualise. We applied an initial coding method to identify key themes and categorise words and sentences (Rennstam & Wästerfors, 2018). To specify the process, each lever of control (Simons, 1994) was given a colour, whereas the relevant information obtained were colour coded into an associated lever of control. The information collected was, thereby, sorted upon recurring categories identified.

Lastly, since all interviews resulted in a substantial amount of sorted data, the most relevant were included in the paper, while some parts needed to be reduced. The reduction process enabled us to reduce data and quotations that either were obvious or that explained already accepted research (Rennstam & Wästerfors, 2018). Sentences and quotes that reflected similar meanings were discussed, whereas solely the ones that constructed a crucial point and were relevant for the study's purpose were picked out. In other words, some parts sorted were relevant but did not depict how the specific innovation types were controlled.

### 3.3 Ethics and quality of research

The motive behind Company X's anonymous participation was a confidentiality agreement. However, the agreement enabled the organisation to share valuable information that otherwise would not have been possible. All information published in the study has been reviewed and confirmed by Company X. For business research with either a qualitative or quantitative approach, certain quality standards need to be met, namely reliability and validity (Bell, Bryman & Harley, 2019). However, for a case study with a qualitative research approach, four other and less quantitative terms may be used to evaluate the quality of the research; credibility, transferability, dependability and confirmability (Creswell, 2007; Bell, Bryman & Harley, 2019).

### 3.3.1 Credibility

Credibility refers to the plausibility and trustworthiness of the information and whether it is interpreted accordingly to the participants' meaning (Creswell, 2007), i.e., respondent validation (Bell, Bryman & Harley, 2019). This was confirmed for this study by sending the material to the participants before publication to allow for potential editing. Additionally, credibility implies for the study to be carried out according to good practice (Bell, Bryman & Harley, 2019). For this study, we established prerequisites for the chosen company to ensure trustworthiness regarding the purpose of the research. The interviewees were carefully selected in order to guarantee their competence and knowledge of the subject. Further, both authors were present and involved in all four interviews to avoid potential misunderstanding and biases between the authors and enable an accurate and more efficient discussion of the data. The transcriptions were made separately, followed by cooperated translation and thematic analysis to enhance validity and avoid biases or incorrect translation.

### 3.3.2 Transferability

In qualitative research, it is the depth of the study that is in focus rather than the breadth, as is the case in quantitative research (Bell, Bryman & Harley, 2019). Hence, it is of great importance for the researcher to provide a thick description of the case, the setting and other contextual factors in order for the reader to make the judgement whether the outcome is transferable to another setting or not (Creswell, 2007; Bell, Bryman & Harley, 2019). For this study, information was collected from both a participant with an overview of the business and additional participants with unit-specific knowledge to enhance the details in descriptions. Due to the anonymity of Company X, detailed descriptions about the company and its business have to be excluded. However, this is not seen as something that will harm the quality of the study due to the emphasis being on the MC practice in relation to the type of innovation. Hence, these areas have been thoroughly described and exemplified.

### 3.3.3 Dependability

Dependability in a qualitative study is comparable to reliability in a quantitative study. It refers to the ability to replicate the study and achieve the same results and the importance of record-keeping throughout the research (Creswell, 2007; Bell, Bryman & Harley, 2019). As mentioned before, the

transferability of a qualitative case study is highly dependent on the resemblance of contextual factors. Thereby, it is difficult to guarantee the reliability of a qualitative case study. Additionally, since open-ended questions were used for the semi-structured interviews and not multiple-choice questions, it is not guaranteed that participants of a replication study would provide the same answers. The questionnaire is, however, replicable for future research since the entire process, formula and questions used is included in Appendix 1 and 2. In order to enhance the dependability, documentation of the process was kept throughout the study, and both authors were present at all interviews to avoid biases. Additionally, all interviews were recorded and transcribed directly after taking place to capture all details and thoughts. All interviews were constructed in the same way, with both authors present and following the same procedure. Finally, the research design and method has been thoroughly described above to enhance dependability.

#### 3.3.4 Confirmability

Confirmability is referring to the objectivity of the research. However, it is more or less impossible to reach complete objectivity in qualitative business research. The researchers are thereby expected to make an effort to minimise biases, personal values and subjective implications (Bell, Bryman & Harley, 2019). For this study, the authors prevented subjectivity by questioning each other's viewpoints and allowing for discussion while analysing all data together to find joint conclusions. Additionally, it is essential that the findings are in line with the interviewees' statements and not influenced by the authors' thoughts and views, and a thorough methodological description enhances the confirmability (Shenton, 2004). The interviewees' understanding of the topic and subject was ensured before asking the interview questions in order to enhance objectivity. Also, all interviews were recorded, enabling us to return to the material multiple times and ensure confirmability. Lastly, a thorough description of the study's methodology is presented earlier in this chapter.

#### 3.3.5 Triangulation

Triangulation is often used to enhance the accuracy and credibility of data. Triangulation refers to using multiple and different sources, techniques and methods for data collection within the same study (Creswell, 2007; Saunders, Lewis & Thornhill, 2007; Easterby-Smith, Thorpe & Jackson,

2015). To be more specific, triangulation may be seen in four different ways, namely, method triangulation, investigator triangulation, theory triangulation and data source triangulation (Yin, 2014; Carter, Bryant-Lukosius, DiCenso, Blythe & Neville, 2014). For this study, the primary method for data collection was semi-structured interviews. Additionally, a questionnaire was also conducted, and secondary data was collected from the company's annual report (2020) to get complementary data. Throughout the study, investigator triangulation took place in the means of the two authors both being present at all interviews, and the data was later transcribed, coded and analysed in collaboration. This study's conceptual framework was constructed through thoughts and ideas originating from different perspectives and existing theories. Hence, the data were interpreted and analysed using different theories illustrated in our conceptual framework. Lastly, data were collected from different individuals within Company X with different positions. An overview was gained through the interview with the Head of R&D, while more unit-specific knowledge was collected from the unit managers. In this way, we were able to assure that the information was correct and not subjective to the one interviewee, but the information could be compared.

### 3.4 Limitations of research method

Subjectivity is a general issue with qualitative research since a great emphasis is placed on the researchers' view and opinions (Yin, 2014; Bell, Bryman & Harley, 2019). The subjectivity and biases for the case company of the interviewees is further a limitation important to have in mind. However, this limitation has been minimised by the anonymity of Company X, hence, the respondents may not be as subjective as if the company would not have been anonymous. An additional attempt to diminish the respondents' subjectivity was to quantify and define the different types of innovation with the innovation scale derived from Bedford's (2015) study. Nonetheless, this quantification could have been performed in various ways. The empirical data is collected through interviews with company representatives. However, the interviewees were solely a part of the top management within the case company. The fact that no subordinates were interviewed also limits the subjectivity of the empirical data. Further, all interviewees have an engineering background working within the R&D function. Thereby, the interviewees' knowledge within management control may be limited, and the paper's outcome does not necessarily mirror how all divisions in an organisation are steered.



Moreover, the outcome of qualitative research, and thus single case studies, cannot with absolute certainty be representative of all cases. Therefore, a single-case study lacks the ability to provide generalising results (Yin, 2014). Lastly, Bell, Bryman and Harley (2019) discuss another limitation of qualitative research, namely the lack of transparency. As the case company needed to be anonymous, the empirical data was limited exclusively to the interviews, questionnaires and annual report. Additional documents and company-specific information could not be included in the study which otherwise could have contributed with a deeper insight.

## 4.0 Empirical analysis

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*In the following chapter, the empirical findings are presented and analysed in relation to the conceptual framework. The results from the questionnaire are illustrated with an innovation scale to specify each unit's innovation type. Lastly, the empirical analysis presents the three units separately, followed by a summarising analysis.*

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To define each unit's type of innovation, the result from the questionnaire generated an average innovation score. The higher score symbolises more explorative innovation activities, while a lower score indicates that the unit applies more exploitative activities (Figure 3). Thus, the questionnaire clarifies the unit's innovation type.

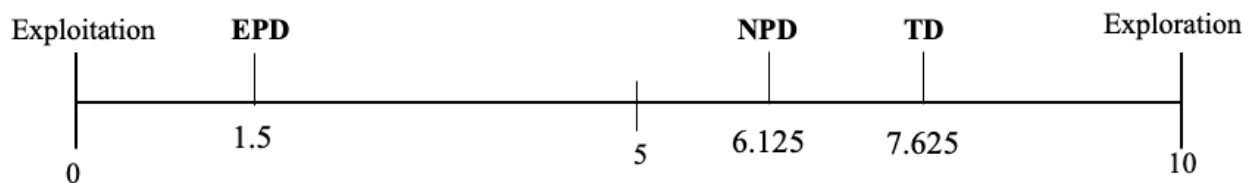


Figure 3: Company X - Innovation scale

### 4.1 Company X

As a multinational corporation, Company X offers a broad range of products and services within their industry. The product portfolio consists mainly of products with long life cycles, to specify, up to 20 years. Moreover, the company is listed on Nasdaq Stockholm and has approximately 15 000 employees. Vision and core values are clearly stated in Company X's annual report (2020). These visions and values are presented by the company's top management and are later broken down within the different units. The vision and core values encourage the employees to be curious and solution-oriented, and this is continuously communicated throughout the company. Thereby, Company X has a culture where creativity and searching for new opportunities is appreciated at all levels in line with the overall goals and strategies of the company.

*Everyone needs to understand our vision and goals, why we exist, and what is strategically important for us. These visions and goals are the same for everyone.” - Head of R&D*

Further in this chapter, the empirical data collected from the interviews will be presented and analysed separately for each unit. Data from the interview with the Head of R&D will be presented in all three units, together with the responsible manager for the specific unit.

## 4.2 Existing Product Development

The Existing Product Development (EPD) unit is responsible for the continuous improvements and maintenance of the existing products. Since Company X's products have a long life cycle, they require continuous developments and efficiency improvements to stay competitive. Since the EPD unit has its focal point on enhancing and developing existing products, it enables Company X to capitalise upon current expertise, hence these activities can be categorised as exploitative (March, 1991). Additionally, the results from the questionnaire strengthen that the EPD unit can be classified as a more exploitative unit than explorative (Figure 4).



Figure 4: EPD - Innovation scale

### 4.2.1 Performance Measurements

The EPD unit utilises budgets and works actively with KPIs. However, since each service task is unique, both budgets and KPIs cannot always be precisely determined. Instead, the unit's budget is set based on previous years and the KPIs function more as a guideline to oversee and steer the performance.

*“One maintenance task can last for two years while another for two minutes. Therefore, it is difficult to set accurate KPIs. [...] But of course, we work with KPIs and try to use them and make them as SMART as possible, that is really important.” - Manager EPD*

*“Some activities are predictable and planned, but suddenly unpredictable costs may occur, for instance, a security risk with the product that requires rapid change and action, leading to fluctuating costs.” - Head of R&D*

Although the EPD unit works with existing technology and products, the required improvements vary and are not always known or predictable. Nonetheless, the KPIs are derived from the overall goals and strategies Company X has, but the EPD unit is not able to measure precise data in all activities. Hence, there are indications that the EPD unit applies a diagnostic control system in line with Simons (1994), where they measure the gap between expected and actual performance. The manager of the EPD unit argued that yearly and long-term targets are important, however, it is crucial to have weekly follow-ups to control the gap between expectation and the actual outcome. In other words, the weekly follow-ups enable the manager to get an overview if the unit works in the correct way towards the long-term targets. Moreover, even though the manager highlighted that it is not relevant to solely rely upon KPIs since the different operations within the unit vary significantly, targets are used in some way as a motivational factor since it enables the manager to see indicators if the performance is on the right track.

*“It is important to see if the targets are relevant or not in order to push ourselves, whilst at the same time acting as a follow-up.” - Manager EPD*

Overall, there are indications that the EPD unit applies some diagnostic tools that work as a feedback system (Simons, 1994). Both KPIs and budgets are applied in this exploitative unit, however, in line with March (1991), solely performing exploitation may reduce the flexibility which the unit was aware of since the manager highlighted the essentialness of not only focusing on numbers.

#### 4.2.2 Opportunity-seeking and communication

Creativity is highly appreciated throughout Company X since it exists in their core values to be curious and solution-oriented. However, within the EPD unit, the manager highlighted the importance of also having employees characterised as being scrutinous and hard working to satisfy the unit’s purpose of improving and maintaining existing products. In other words, a mix of

personalities is said to be essential. Creativity may not always be needed in their daily work, however, it may be valuable when a problem occurs with an existing product.

*“We cannot solely have people that think outside the box because that is not what they are asking from our unit. [...] We need people that understand the importance of hard and efficient work. It is essential, and it is of value for Company X.” - Manager EPD*

Simons (1994) argues that interactive controls can be used to encounter threats and uncertainties with creativity and opportunity-seeking. Thus, it may not be as important for the more exploitative EPD unit to encourage creative activities to a large extent since they operate within current expertise. Risk and threats beyond their operating area do not impact the daily activities and are thereby not included in EPDs responsibilities.

*“It is more of improving details and technicalities when developing existing products, it requires small improvements regularly and therefore, larger trends do not affect the operation in the same way as for the exploration of new products.” - Head of R&D*

The exploitative and coercive nature of the EPD unit is seen in their routine-like tasks (March, 1991; Adler & Borys, 1996). Within the EPD unit, solutions are stored in a common and shared support database in order to solve recurrent problems in the future. Thus, contrary to explorative activities that commonly apply interactive sessions to solve complex issues, the database with historical solutions and the routine-based area illustrates that the EPD unit does not need to apply an interactive control system due to its exploitative activities (Simons, 1994).

#### 4.2.3 Culture

The manager of the EPD unit explains that the company’s formal values are put into practice through unit-specific strategies and goals. In other words, they are broken down into more unit-specific actions. Further, the manager argues that on a unit-level, the formal and intangible company visions need to be specified and more tangible to steer the employees in their daily work and actions.

*“The company has a stated culture. It includes how we want our employees to act, how we want our managers to act. This lays the foundation for how the entire company is steered.” - Head of R&D*

*“Each unit needs to convert these visions and targets into more tangible goals. The further down the pyramid, the more hands-on the vision gets.” - Manager EPD*

Since Company X applies a culture including vision and core values from the top executives to direct the employees in line with the company's overall objectives, a beliefs system is noticeable (Simons, 1994). Further, in line with Simons' (1994) view of a beliefs system, the top management arranges presentations and activities to make sure that the company's culture is communicated. They also have a continuous discussion with the unit managers, who later pass this on to their subordinates. Nonetheless, Simons (1994) highlights that the beliefs system has the purpose of stimulating creativity beyond daily tasks. This is not really seen or needed in the EPD unit since the aspiration of the unit is to maintain existing products and provide support in a routine-based manner.

#### 4.2.4 Limitations and risk avoidance

Since Company X is a large global company, each business unit has a formal and narrowed operational area with clear guidelines and expectations of what to achieve. The EPD unit's function within Company X is more or less straightforward, in other words, their purpose is to maintain and improve existing products. The environment in which the EPD unit operates is stable without major uncertainties since there is a high degree of existing knowledge regarding the products they maintain. Hence, one may see that the exploitative activities of the unit are characterised by the stable environment, which is in line with March's (1991) theory and also that the specific function of the EPD unit has clear boundaries for the unit as a whole (Simons, 1991).

*“You have more freedom when you work with technology development because you do not know what is interesting or not, but when you work on an existing product, it is very clear. We have a problem with a product, and that problem should be solved. It is more specific and narrowed.” - Head of R&D*

The operational area for the EPD unit is evident and involves previously mentioned routine-based tasks. Due to their existing knowledge and expertise, their work can also be more coercively steered even if the unit solves complex issues (Adler & Borys, 1996). To specify, the unit receives an issue with a product, the database that stores historical data of problems is used to identify the potential solutions together with the existing expertise of the product. In other words, the tasks are clearly defined. They are supposed to stay within their area of existing products, and they are aware of this.

*“There is a clear distinctness of our unit, I would say. Of course, there are exceptions but in general it is clear what we do. We are aware of the expectations and what tasks to accomplish.”*

*- Manager EPD*

The stable environment, together with the clear expectations, could be seen as Simons' (1994) business conduct boundaries. To specify, both the manager and the Head of R&D explained that the employees should perform their tasks within their operational area, however, creativity is encouraged within that. In the case of the EPD unit, as long as the employees focus on maintaining and developing the existing products, creative solutions are appreciated. Thus, within the EPD unit, there are no limitations or risk avoidance stated regarding what the employees should not do. Instead, the expectations of their role are already agreed upon indirectly.

### 4.3 New Product Development

The New Product Development (NPD) unit develops new products based upon existing knowledge and technology. The unit develops new products for the company's product portfolio or applies a new material or new technique that improves the quality and efficiency of the product. The NPD unit has a close collaboration with the Technology Development (TD) unit, which explores and develops the new material or technology that the NPD unit later applies. Thus, the NPD unit utilises the new material or technology developed by the TD unit to create new products and solutions to the product portfolio for Company X. Since the NPD unit utilises existing knowledge but explores new opportunities, they combine exploitative activities with explorative activities and can thereby be categorised as an ambidextrous unit (O'Reilly & Tushman, 2013). The questionnaire sent to Company X also confirms NPD as an ambidextrous unit, however, the innovation scale indicates a marginally excessive balance on explorative activities than exploitative (Figure 5).



Figure 5: NPD - Innovation scale

#### 4.3.1 Performance Measurements

The NPD unit controls and monitors projects with budgets and performance requirements. Since the development processes of new products are predictable, the manager explains that it enables the operations to follow the pre-set budgets accordingly. There are several aspects within the NPD unit that are measurable, the budgets are set based upon historical knowledge, the new product has performance requirements, and the projects have predetermined due dates. For products to be approved, certain performance requirements must be achieved in order to ensure their relevance to the market. To specify, the unit has three main KPIs, technical performance, mechanical performance, and cost requirements. According to the NPD manager, these measurements are crucial in order to survive in a highly competitive market. Thus, diagnostic control tools are applied within the unit to both satisfy financial targets in terms of budgets but also through technical KPIs of the product's capacities (Simons, 1994).

*“When developing new products and technologies, the process is very predictable. We know exactly the cost of the development process and how to determine the budget. The results are usually close to the estimated costs.” - Head of R&D*

*“We make the budgets based on quite accurate historical data. We are expected to meet the budgets and make continuous follow-ups both on time schedules and costs. Because all products are expected to perform as planned.” - Manager NPD*

The NPD unit's performance measurements characterise as Simons' (1994) diagnostic control system where outcomes are compared to estimations. In accordance with Simons (1994), the NPD unit's diagnostic control system oversees and controls the unit's performance. For instance, the NPD manager exemplified that the unit could have the mission to develop a new product similar



to an existing one, but with a target for the new product to be at least 20% more efficient than the previously offered product. Simons' (1994) argues that the diagnostic control system could be seen as a feedback system for the organisation to monitor performance. In the case of the NPD unit, a virtual dashboard including all projects' status is used as a control tool. Together with the project leaders, the manager does weekly updates regarding all ongoing projects to be aware of potential problems and deviations. The dashboard is thereby an example of qualitative and quantitative measures that provide regular feedback to the manager within the diagnostic control system (Simons, 1994).

#### 4.3.2 Opportunity-seeking and communication

Being creative and searching for new opportunities is appreciated throughout Company X, which all interviewees confirmed, and it can be observed within the NPD unit. The manager highlights that creative employees are value-creating both for the company but also important for the individual's personal development. However, due to the predictable development process based upon existing technology, the NPD unit does not highlight or encourage excessive creativity while working within the projects. Instead, creativity is more highlighted in between the projects where the unit provides time to explore the opportunities previously found during projects.

*“Creativity is important. However, while in a project I do not want my subordinates to drift away. I mean, we have our targets to achieve, and we have our performance requirements to accomplish. Therefore, in the development projects, the focal point is on our tasks.” - Manager NPD*

*“We try to find time between the development projects, the subordinates are not always supposed to go straight from one project to another, there is often time in between the projects to explore opportunities and creative solutions.” - Manager NPD*

Simons (1994) explains, the diagnostic control system narrows and limits opportunity-seeking while interactive control systems encourage creativity and explorative activities. For the NPD unit, within the projects, the employees are steered through a diagnostic control system which is possible due to its predictable environment. The projects, based upon existing technology, enable clear guidelines and knowledge among the employees, thereby are the development projects more

characterised by exploitative activities while explorative activities are noticeable in between the projects (March, 1991). In the time between the projects, a more interactive control system is applied since creativity and opportunity-seeking is encouraged (Simons, 1994). Thus, the innovation types, exploitation and exploration, occur in different time periods, which is similar to sequential ambidexterity (O'Reilly & Tushman, 2013). Furthermore, the time within projects is more coercively steered while enabling control mechanisms are used in between the projects (Adler & Borys, 1996).

According to the NPD manager, information and knowledge are shared and communicated through interactive processes such as competence forums and networks (Simons, 1994). This enables the unit to share and receive expertise, both within the unit but also throughout the organisation. This exchange of information combined with existing data contributes to a discussion of projects' potential risks and threats, and action plans may take place. Additionally, the encouragement for creativity within the interactive control system is seen through a reward system. If an employee discovers and develops a solution that contributes to securing a patent, the individual is rewarded. This rewarding tool within the interactive control system is in line with Simons (1994), who argues that rewards for ideas that create value can positively impact the motivation of the employees.

#### 4.3.3 Culture

Similar to the EDP unit, the NPD unit's vision and goals are developed from the company's overall culture and follow a top-down approach. According to the NPD manager, goals are more clear and more specific further down in the organisation, while at the top, the targets are more visionary. The manager breaks the overall company visions down into specific goals for the unit and the individual to meet the overall objectives.

*“We have a shared culture within the company, and it should not differ. Although, what you do and how you work within the different units may impact how the culture is practised.” - Head of R&D*

*“There are documented visions and goals, then depending on what level you are working on, the degree of clarity or distinctness vary.” - Manager NPD*

Similar to how Simons (1994) describes, the shared comprehension of Company X's core values comes from the continuous discussions and development of NPD's strategies and goals rather than from the documentation of them. However, the NPD employees sometimes perceive the purpose of the visions as complex to understand. In other words, the visionary statements' significance for the individual employee is in some cases difficult to comprehend. Thus, a beliefs system is clearly observed and regularly discussed within the NPD unit, but its function for the unit may be vague for the individual in their daily work. Although, the beliefs system contributes to the long-term purpose of the company (Simons, 1994).

#### 4.3.4 Limitations and risk avoidance

As mentioned, the NPD unit has clear guidelines within the projects with stated time schedules. This leads to creativity being encouraged within the frames of the project and explorative activities beyond the operating area are postponed to the time in between the projects. Similar to Simons (1994), boundary systems do not necessarily limit individuals' creativity, rather it defines the area where creativity is allowed to prosper. In the case of the NPD unit, the boundary system rather defines when creativity outside the box is encouraged.

*“I would not say we have limitations on how to act, but we have clearly defined guidelines within our operating tasks, and we have clear processes that subordinates are supposed to act according to within the specific projects.” - Manager NPD*

*“In the exploitative parts, there are more clear guidelines than in the explorative part.” - Head of R&D*

As noticeable, within the projects, the NPD unit is more coercively steered within the boundaries of the project (Adler & Borys, 1996), which also is in accordance with Simons' (1994) strategic boundaries where the explorative activities are directed to the specific project. Contrary, in between the projects, the employees are more enabled to explore outside the existing boundaries. The NPD units as an ambidextrous unit both apply coercive and enabling control mechanisms depending on what type of innovative activity, exploitative or explorative, is practised. Additionally, the manager and the Head of R&D explained that the NPD unit conducts new guidelines and manages risks in a learning by doing approach. If something does not work as

supposed, similar to Simons (1994), new boundaries are implemented in a reactive manner to improve operations.

#### 4.4 Technology Development

The Technology Development (TD) unit explores and discovers new materials and technologies which are later applied by the NPD unit in the development of new products. Furthermore, the TD unit not only explores within Company X's operating area but also seeks opportunities outside to discover techniques relevant for their business. Thus, those exploratory characteristics indicate that the TD unit can be defined as an exploratory unit (March, 1991). The innovation scale based upon the questionnaire further confirms the exploratory classification (Figure 6).

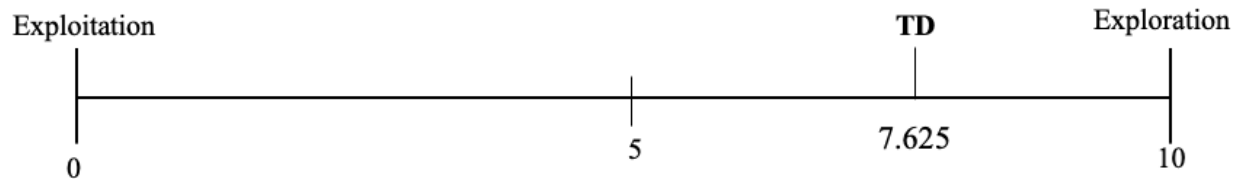


Figure 6: TD - Innovation scale

##### 4.4.1 Performance Measurements

The TD unit has the mission to explore and seek opportunities beyond existing knowledge resulting in an uncertain operating environment. The dynamic and unpredictable environment makes it difficult to control the unit with performance measurements. When exploring new materials and technologies, an agile and incremental approach is used in order to discover if the opportunity is worth putting more resources on. Thus, budgets and KPIs are difficult to predict in an accurate and precise manner, instead, the TD unit has an overall budget it can allocate as suitable for the different projects.

*“The Technology Development unit works on materials or technologies that may be commercialised in 5 or 10 years, leading to an unpredictable future.” - Head of R&D*

*“If we only work according to set financial goals, my subordinates would not try to explore areas where there is a risk for failure, and that would lead to reduced knowledge.” - Manager*

*TD*

The TD unit’s unpredictable environment leads to that a diagnostic control system cannot monitor the activities since precise data is difficult to determine. This is aligned with Simons’ (1994) statement regarding the ineffective use of diagnostic control systems. Moreover, since the diagnostic control system narrows opportunity seeking, it is not in line with the objectives of the TD unit. Rather, a diagnostic control system could limit and reduce the employees’ creativity. In line with the literature, the exploratory and experimental nature of their objectives implies that it is complex to estimate the outcome (Simons, 1994).

*“My colleagues who work as project managers or developers or possess other technical expertise predetermines a budget of what they think, but their work is not evaluated based on that budget. The outcome may be over, it may be under, however, it is more to get an overview.”*

*- Manager TD*

Pre-set budgets and performance measures are not used as definitive control tools within the TD unit to evaluate the outcome. Hence, diagnostic control tools are not seen as applicable as a feedback system for the TD unit since the estimations are not relevant to compare with the outcomes (Simons, 1994).

#### 4.4.2 Opportunity-seeking and communication

The TD unit’s main objective is to explore and develop new materials and technologies in an uncertain environment. In order to stimulate a creative mindset, the TD unit’s employees are given great independence where opportunity-seeking outside the operating areas is encouraged. Commonly, according to the TD manager, projects in an early phase need acceptance for failure to encourage employees to explore and experiment with potential solutions that have not been tested before.

*“A creative mindset outside the operating areas is crucial while working with technology development since you explore undiscovered solutions. For example, you must keep up with changes and understand trends globally.” - Head of R&D*

Interactive control systems encourage creative thinking and opportunity-seeking, both internally and externally, which is observable in the TD unit (Simons, 1994). The TD unit utilises interactive activities such as internal network sessions to stimulate creativity and share knowledge. In addition to the internal competence forums that the NPD unit also applies, the TD unit attends external events to learn from expertise outside the organisation. For instance, the unit sometimes observes start-ups developing new interesting materials or technologies that could be relevant for their own business.

*“When exploring new possibilities, you need to discover and seek opportunities externally. Because in TD we strive to find the next big seller. We are chasing what is interesting.” - Head of R&D*

The TD unit’s continuous exploration for new opportunities and solutions is in line with Simons’ (1994) argument that the interactive control system can be used to mitigate threats from the competing environment. Attending events and discovering new knowledge outside the organisation enable the TD unit to be flexible and adjust to a dynamic environment, which is essential for an effective interactive control system (Simons, 1994). As Simons (1994) further argues, it is important to be aware of existing risks to enhance creativity. The TD manager describes how they continuously evaluate risks and uncertainties to move forward in their processes.

*“We are always striving to increase our knowledge and understanding in order to decrease risks and uncertainties.” - Manager TD*

The TD unit contains technically skilled employees solving complex tasks in order to develop new materials and technologies that could be commercialised by Company X. Thus, the unit’s focus on interactive sessions and encouragement for autonomous thinking in a relatively unrestrained environment illustrate that enabling control mechanisms are noticeable (Adler & Borys, 1996).

The employees are not coercively steered with diagnostic controls, instead, the interactive control system enables them to explore their creativity and encourages a curious mindset.

#### 4.4.3 Culture

Company X's overall culture and visions are clearly stated and regularly communicated within the TD unit to steer the performance in line with the company's objectives. Although, a more autonomous environment characterises the culture within the unit to generate a purpose for the individual. For the unit to succeed with their strategy where the employee is given a great responsibility, is encouraged to take initiatives, and explore outside the operating area, each individual needs to understand their role and purpose as an employee. It is important that all employees share the same values and working morale to work towards the same goals.

*“The formal visions are used to engage employees in the long-term goals. However, if you disagree and are not willing to understand who we are and what we do, it will be difficult. [...] Everyone has a personal responsibility for their individual development and future success.” -  
Manager TD*

It is observable that the TD unit takes part of the overall beliefs system in Company X. Nonetheless, the discussion from the stated visions and goals are more targeted for the individual in order for them to find a purpose in the explorative environment of the unit. Thus, the shared values within the TD unit work as a beliefs system with a function to enhance the employees' motivation to be solution-oriented when confronted with problems and complex tasks (Simons, 1994). In other words, the shared view of how to act and behave in certain situations, to achieve the common goals, is learnt from the stated and communicated visions.

*“If you work with explorative activities, you need specific characteristics. You need to be curious and enjoy working with the unpredictable, complex tasks without known solutions.” - Head of  
R&D*

It is noticeable that the formal beliefs stated by Company X construct a long-term vision for the employees where the core values, as Simons (1994) argues, motivate the subordinates within the TD unit to act accordingly and perform their individual tasks in line with the unit's purpose. Hence,

the TD unit's beliefs system works as a motivational control mechanism to enhance the individual's commitment and create a team of employees appropriate for the unit's tasks (Simons, 1994).

#### 4.4.4 Limitations and risk avoidance

The TD unit allows their employees to explore, in general, everything that in some way can create value for Company X in the future. Today's dynamic environment leads to that solutions within other industries may be of relevance for Company X to apply in their business. Thus, the TD unit does not state or communicate any limitations of which areas the employees should not investigate. Although, since the mission of the unit is clear, the subordinates indirectly know what is relevant or not. The mission of the unit is to explore materials or technologies that later can be included in the NPD unit's development processes of new products.

*“It is really difficult in these times to restrict and forbid someone to explore certain areas. As long as the purpose is clear, you are allowed to explore outside the border of our business area.” - Manager TD*

*“You have a greater freedom when you are working with technology development because you do not know what is interesting or not.” - Head of R&D*

Contrary to what the TD unit does when they allow their employees the freedom to explore without any restrictions, a boundary system has the purpose of constraining employees' options (Simons, 1994). In other words, according to Simons' (1994) definition, the TD unit is not controlled by a boundary system since they do not restrict their employees from exploring opportunities outside the business' boundaries. The TD unit utilises more enabling control mechanisms as they allow their employees to explore freely in a dynamic setting (Adler & Borys, 1996). However, the TD manager explains that restrictions are first introduced when an explorative project's costs exceed the potential value, in other words, when the risk is too high to continue. This is similar to Simons' (1994) explanation of boundary systems, demonstrating that explorative activities require significant resources, whereas boundaries have the ability to guide which activities are worth exploring.



#### 4.5 Company X - Revised conceptual framework

The empirical data categorised through the following keywords; Performance measurements, Opportunity seeking & Communication, Culture, and Limitations & Risk avoidance are associated with Simons' (1994) LOC; Diagnostic control system, Interactive control system, Beliefs system, and Boundary system. Following, each unit is analysed through the scope of the conceptual framework.

<b>Type of innovation</b>	<b>Ambidexterity</b>			
	<b>Exploit</b>		<b>Explore</b>	
<b>Type of MC</b>	<b>Boundary</b>	<b>Diagnostic</b>	<b>Interactive</b>	<b>Belief</b>
	Limitations & risk avoidance	Performance measurements	Opportunity seeking & communication	Culture
	<b>Coercive</b>		<b>Enabling</b>	

Figure 7: Revised Conceptual framework (Petersson & Stiernspetz, 2021)

##### 4.5.1 Exploitative unit - Existing Product Development

The exploitative nature of the EPD unit is observable since it characterises routine-like activities based upon existing knowledge which is in accordance with March's (1991) definition of exploitation. Furthermore, the KPIs within the diagnostic control system are useful since they enable managers to measure the gap between outcome and expectations. However, for the unit's more unpredictable tasks, the diagnostic control tools operate more as guidelines of the performance rather than set targets. Nonetheless, the variation of operations within the EPD unit induces that the budgets and KPIs that are utilised are not predictable enough to solely rely on. Hence, the diagnostic control system is supported by other levers of control (Simons, 1994).

The distinct operating area of the EPD unit creates boundaries for the employees to work within. Moreover, the clear expectations of the unit, together with the set KPIs, form a more coercive business environment for the unit as a whole, even though employees are encouraged to be creative when solving their tasks. Thus, Adler and Borys' (1996) coercive mechanisms are seen for the unit-level but not for the individuals within the EPD unit. Furthermore, the clear objective of the

unit results in that the interactive control system is noticeable only internally within the EPD unit and does not go beyond the unit-level. In other words, the interactive control system stimulates internal creativity and shared knowledge. However, since the EPD unit is not expected to oversee risks and threats outside their expertise, no extensive interactive control system is identified (Simons, 1994). The beliefs system of the EPD unit is clear, although the system is more an overall control system where the values, culture and beliefs are seen throughout the entire company. In other words, there is no unit-specific beliefs system. Instead, the beliefs system is broken down from top to bottom within the organisation (Simons, 1994). One main core value is to be constantly solution-oriented and find new ideas and solutions to challenges, resulting in more enabling control on an individual-level whereas the unit is more coercively controlled (Adler & Borys, 1996).

#### 4.5.2 Ambidextrous unit - New Product Development

As the NPD unit develops new products based upon existing knowledge, they combine exploitative and explorative activities in an ambidextrous approach. Due to their predictable processes with clear guidelines, the projects are characterised by exploitative activities, while the time between the projects implies more explorative activities (March, 1991). Hence, the innovation types are practised in different periods, resulting in the unit applying sequential ambidexterity. The sequential ambidexterity encounters the issue that exploitative and explorative activities compete about the same resources in an antagonistic manner (Gupta, Smith & Shalley, 2006). According to O'Reilly and Tushman (2013), sequential ambidexterity has been criticised for being ineffective in dynamic environments, however, since the NPD unit has predictable projects, the criticism does not concern this unit.

The dashboards monitor and provide feedback to the managers regularly to assure that the projects are in line with the set expectations. Thus, the guidelines of the projects combined with monitoring control mechanisms steer the projects in a coercive manner. The exploitative activities within the unit are thereby controlled by the boundary system and the diagnostic control system. Meanwhile, creativity beyond the projects' boundaries is encouraged and enabled between the scheduled time frames through, for example, the competence forums. Moreover, the overall visions stating a creative mindset within Company X are seen during the time in between projects. Thus, the exploratory activities have indications of being more controlled by the interactive control systems and the beliefs system (Simons, 1994; Adler & Borys, 1996).

As the innovation scale indicates, the nature of the NPD unit is more explorative than exploitative since they develop new products leading to a score closer to exploration. Nonetheless, the unit's environment and processes are predictable due to their experience of developing new products, which according to the literature, is commonly characterised by exploitative activities. Thus, even if the unit's mission is to develop new products, exploration, the use of existing knowledge, exploitation, result in an ambidextrous unit (March, 1991; O'Reilly & Tushman, 2013).

#### 4.5.3 Explorative unit - Technology Development

Exploratory, experimental and opportunity-seeking traits are observable in the TD as the unit investigates undiscovered solutions. Those activities combined with the questionnaire defines the unit as an explorative unit (March, 1991). The encouragement of a curious mindset without restrictions and with great independence for the employees, signifies that the unit is steered by enabling control mechanisms (Adler & Borys, 1996). Furthermore, the unit does not apply a diagnostic control system since performance measures and budgets do not influence the operational practices as outcomes are difficult to estimate. Instead of a diagnostic control system that narrows the opportunity-seeking, which is contradictory to the unit's objectives, the TD unit's characteristics are more in line with the interactive control system. These characteristics are noticeable through the competence forums as well as the opportunity-seeking within other industries. Thus, these activities have the aspiration for the employees to be aware of opportunities beyond the operating area that could be value-creating, which are the main traits of an interactive control system (Simons, 1994).

The exploratory nature of the TD unit is not steered by restrictions and limitations, thereby, a boundary system by Simons' (1994) definition is more or less not noticeable within the unit. The TD unit encourages creativity rather than restricts it in order to achieve its objectives. Instead, a greater emphasis on the beliefs system is observable. Due to the allowance for autonomous work, the company's overall values have a great impact on the individual employee to understand their purpose and what is expected of them. The beliefs system triggers the employee's intrinsic motivation to work in line with Company X's visions (Simons, 1994).

#### 4.5.4 Summarising analysis of conceptual framework

Company X's MCS varies depending on the innovation type of the unit. In accordance with the conceptual framework, the exploitative EPD unit uses a diagnostic control system to measure and monitor its performance. The EPD unit's distinct operating area containing routine-based tasks construct boundaries for the unit to operate within. However, the overall beliefs system of Company X is noticeable within the unit as the individuals are encouraged to have a creative mindset. Although, the EPD unit is coercively steered to primarily perform the unit's tasks, hence the unit boundaries narrow and specify where creativity is encouraged. The explorative TD unit constantly seeks further knowledge through interactive sessions, both internally and externally, to extend the expertise within the company. As the unit explores in an uncertain environment, the employees are encouraged to be autonomous and constantly be aware of opportunities beyond their current capabilities. Hence, an emphasis on interactive controls is observed within the unit. Additionally, Company X's overall beliefs system intrinsically motivates the individuals in the TD unit and enables them to constantly explore and seek for potential solutions. In the ambidextrous NPD unit, all levers of control are noticeable, however, not simultaneously. The unit practices exploitative and explorative activities in a sequential manner where the beliefs system overlaps both activities. The exploitative activities are more coercively steered with diagnostic controls and boundaries, whereas the explorative activities enable the employees to interact and seek opportunities outside their current knowledge.

## 5.0 Discussion

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*The following chapter discusses the empirical findings in relation to the literature. The chapter includes both a discussion regarding the explored case as well as beyond the case company.*

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As previously mentioned, research indicates that MCS needs to be customised accordingly depending on which type of activities the unit or organisation practices, including the type of innovation (O'Reilly & Tushman, 2013; Bedford, 2015). This is noticeable in this study as Company X controls and steers their units differently depending on the unit's type of innovation, i.e., exploitation or exploration. One can further observe that the predictability of the operating environment for the unit is a contingency factor that impacts how the employees are guided, which is in line with Haustein, Luther and Schuster (2014). Adler and Borys (1996) and Benner and Tuschman (2003) argue that coercive control is beneficial in a stable environment, while more enabling control is more appropriate in an unstable and uncertain environment. This is seen in Company X since their exploitative activities that are based upon existing knowledge are more coercively steered while the explorative activities have a more enabled control (Adler & Borys, 1996). On the other hand, the activities of developing new products in the ambidextrous NPD unit are more coercively steered than enabled since they are expected to use the existing knowledge and techniques developed by the explorative TD unit. However, this may be due to the predictability of the NPD unit's projects and the fact that these projects are steered and controlled by diagnostic tools. The predictable NPD projects enable that the planning controls combined with both budgeting tools and cybernetic control tools (Malmi & Brown, 2008) can be systematically utilised since the time schedules of the projects interplay with the budgeting processes as well as with the products' performance measures (Grabner & Moers, 2013).

Bedford's (2015) findings argue that ambidextrous firms benefit from a combined use of diagnostic and interactive controls. Similarly, this study shows that the ambidextrous NPD unit applies diagnostic and interactive controls. Since they use diagnostic tools within their predictable projects and they use more interactive controls in between the projects, one may argue that interactive controls are more frequently used when diagnostic tools are not applicable. One can

notice that the more predictable a project, task or activity is, diagnostic tools can be applied to monitor the performance of it. This study further indicates that the diagnostic control system functions as a feedback system for exploitative activities to guide, steer and control employees' behaviour in accordance with the objectives of the organisation. Meanwhile, for explorative activities, the employees rely more upon the beliefs system as a guideline to steer and motivate them in line with the organisational vision. In the case of Company X, the company's beliefs system is seen in all three units. However, since the TD unit is not motivated by financial performance measures and targets, they are more intrinsically motivated through the beliefs system and company visions. According to Ouchi (1979), this phenomenon can be compared to clan control, where the employees individually share the same values and visions as the organisation. The TD unit's employees are characterised as intrinsically motivated individuals with high expertise and a solution-oriented mindset, which result in a shared and implicit culture within the unit.

The boundaries within Company X are in one way formed by the organisational structure rather than stated restrictions from the management. In other words, instead of set and predetermined restrictions, the boundaries are created from the operational activities and area. One may argue that boundaries of what not to do are not necessary since it is implicitly understood due to the clear guidelines of what to do. However, one may argue that the lack of clear boundaries is caused by geographical circumstances and cultures and might be more noticeable in other settings. For instance, clear and strict boundaries may be more noticeable in a company located in a country with a different culture than Sweden, where the organisational environment is more hierarchical and rigid (Lubatkin, Lane, Collin & Very, 2005). Moreover, what would the outcome be if the ambidextrous unit would have been more exploitative in its nature? For Company X, the ambidextrous unit explores new products with existing knowledge and had a score of 6.125 on the innovation scale. What if the ambidextrous unit would have exploited and developed existing products with new knowledge and instead had a score less than 5? One may believe that the interactive controls may be reduced, and the unit would be influenced by clearer boundaries, and a great emphasis would be placed on the diagnostic controls with less implications of a beliefs system.

Luger, Raisch, and Schimmer (2018) claim that ambidextrous companies will have the challenge to balance their exploitation and exploration as these activities compete paradoxically for the same resources. Company X balances their ambidexterity similar to Stettner and Lavie's (2014) proposal to specialise and separate the innovative activities in different subunits. Nevertheless, this does not necessarily indicate that the activities no longer compete for the same resources. Although, this issue raises the demand for shared beliefs of the organisation to create common targets beyond the borders of the units. How would the resource allocation look in a company that does not balance their ambidexterity through separate units but instead shifts between exploitative and explorative activities? If that company were to use the same personnel for the shifting activities, they would probably need a great emphasis on the company's beliefs system to create a common and shared culture in order to ensure good collaboration and joint work towards the same objectives. This would also influence the utilisation of diagnostic and interactive controls. Would there be a dynamic tension between the opposing controls and innovative activities? In other words, would the controls shift simultaneously as the innovative activities shift, since the exploitative activities are more measurable and the explorative activities require more interactive sessions.

## 6.0 Concluding remarks

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*In the last chapter, a conclusion of the paper is presented, followed by contributions and practical implications. The chapter ends with general reflections and suggestions for future research.*

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### 6.1 Summary of empirical findings

The purpose of the study was to explore if and how exploitative and explorative units within the same firm require different adaptation of MCS by answering how the management control varies depending on the type of innovation within an ambidextrous firm.

The study indicates that ambidextrous firms apply different MCS depending on what innovation type the unit practices. Exploitative activities commonly have a more predictable operating environment as those activities aspire to improve existing knowledge and processes. The findings further imply that the more predictable a project or working tasks is, the more actively are measurable control tools utilised within the units. Hence, as exploitative units are able to measure and compare outcomes with estimations, diagnostic control systems are commonly utilised and applied. The study further indicates that exploitative activities do not necessarily constrain creativity, rather specify when and where creativity is allowed through its boundary system. Units practising explorative activities seek new opportunities and knowledge beyond current expertise and have thereby a more uncertain operating environment. The findings imply that these activities are more difficult to estimate and measure, hence, diagnostic controls are not suitable. Instead, interactive controls are utilised to encourage creativity and learning where knowledge later can be shared within the organisation. Additionally, the study indicates that the higher the score on the innovation scale, the greater impact the belief system has on the individual employee. It indicates that explorative activities require more autonomous thinking and a shared vision between the employee's goals and the company's objectives.

Further, the findings of this study show that when both types of innovations are practised together, i.e., ambidexterity, the MCS focus primarily on a combined use of diagnostic and interactive control systems. Indications of boundaries and beliefs systems are also noticeable, but not to the



same extent as the other levers of control. Boundaries are rather created through the operational structure, where creativity beyond the operating area occurs between the more exploitative projects. Similarly, the overall beliefs system motivates the individual employee to have an explorative mindset. Since the activities are predictable and measurable, outcomes often meet the estimations, and diagnostic tools control the activities. However, since the objectives are of explorative nature, interactive controls are utilised in order to steer the employees towards a creative mindset and a continuous sharing of knowledge. Finally, the study's findings show that Swedish ambidextrous manufacturing firms more coercively steer exploitative activities while applying more enabling control mechanisms in an explorative environment. This study demonstrates that ambidextrous firms may balance their ambidexterity by separating units that specialise in the different types of innovation.

## 6.2 Contributions and practical implications

By answering the research question, this study supports and extends the theoretical research within innovation and management control. Firstly, this study broadens Bedford's (2015) quantitative research with a qualitative case study approach and in a different geographical setting, resulting in a deeper understanding. The innovation scale created from the questionnaire contributes to the understanding that the innovation types, in other words, the ambidexterity, is not always perfectly balanced. Although an organisation argues to practice a specific innovation type, the innovation scale provides the possibility to see to what extent the innovation type is performed. This could work as a guideline for managers while applying their MC tools and managing their ambidexterity. Secondly, the conceptual framework creates a foundation for future research of MCS in ambidextrous firms to further explore the relation between Simons' LOC (1994) and innovation type. The study further contributes to how various contingency factors affect the MCS. In other words, the case study broadens the insight of how the predictability of the operational environment combined with the innovation type has the potential to affect the MCS. Further, the outcomes provide practical insights into how a large corporation manages its innovative activities. Managers may use the innovation scale as a tool to quantify their innovation in order to customise their MCS. Lastly, the study further contributes and extends the description of the linkage between innovation and MCS, as neither innovation nor MCS works in isolation.

### 6.3 Limitations and suggestions for future research

For future research, the limitations of this study would be interesting to take into consideration. As the study uses a single case approach, a suggestion for future research would be to perform the study with another methodological approach. A quantitative method with a larger sample could increase the generalisability, and this could for instance be accomplished through surveys. Additionally, studies of other geographical areas and industries would further extend and add to the research area. It would be interesting to see to what extent the results would be generalisable. In other words, if contextual factors such as geographic location, industry, company size or ownership, would influence the results. Another suggestion for extending the research would be to further investigate how companies balance and divide their resources among exploitative and explorative activities. This could be performed through collecting data from, for instance, Chief Financial Officers, Chief Executive Officers or controllers that manage and decide where to allocate the financial resources. Future research could also investigate if and how the performance is affected depending on the type of ambidexterity. In other words, if companies apply a sequential or simultaneous ambidexterity impact the financial performance. To investigate this issue, a quantitative research approach would be the most appropriate for a generalised view.

Future research could include subordinates in the study sample to investigate if they perceive the controls to be applied and used in the same way as the managers believe they are doing. In other words, the subjectivity of how people perceive a control system can vary. Therefore, it would be interesting to ask the same questions to both the top management and the subordinates in order to see if they provide similar answers or not. Another interesting and potential approach would be to use a different theoretical framework for the MCS, for instance, Merchant and Van der Stede's (2012) Objects of Control, to further broaden the research area. Finally, as this study has investigated an organisation that separates its innovative activities into different units, it would be of interest to investigate how an organisation that shifts between exploitation and exploration manages and adjusts its control system in relation to what innovation type it practices at the time.

# Appendices

## Appendix 1 - Questionnaire

I vilken utsträckning (skala 1-10) prioriteras följande, inom respektive del?

### **Existing product development**

*I vilken utsträckning (skala 1-10) prioriteras följande:*

1. Låga kostnader på produkter och tjänster

Svar 1-10:

2. Att vara först på marknaden med nya produkter eller tjänster

Svar 1-10:

3. Att frekvent introducera nya produkter eller tjänster

Svar 1-10:

4. Att experimentera med nya produkter och tjänster

Svar 1-10:

5. Förbättra kvaliteten på befintliga produkter och tjänster

Svar 1-10:

6. Att frekvent, men stegvis, modifiera och utveckla befintliga produkter

Svar 1-10:

7. Öppna och starta nya produkt/tjänstemarknader

Svar 1-10:

8. Öka stordriftsfördelar (economies of scale) av befintliga produkter eller tjänster

Svar 1-10:

### **New product development**

*I vilken utsträckning (skala 1-10) prioriteras följande:*

1. Låga kostnader på produkter och tjänster

Svar 1-10:

2. Att vara först på marknaden med nya produkter eller tjänster

Svar 1-10:

3. Att frekvent introducera nya produkter eller tjänster

Svar 1-10:

4. Att experimentera med nya produkter och tjänster

Svar 1-10:

5. Förbättra kvaliteten på befintliga produkter och tjänster

Svar 1-10:

6. Att frekvent, men stegvis, modifiera och utveckla befintliga produkter

Svar 1-10:

7. Öppna och starta nya produkt/tjänstemarknader

Svar 1-10:

8. Öka stordriftsfördelar (economies of scale) av befintliga produkter eller tjänster

Svar 1-10:

### **Technology development**

*I vilken utsträckning (skala 1-10) prioriteras följande:*

1. Låga kostnader på produkter och tjänster

Svar 1-10:

2. Att vara först på marknaden med nya produkter eller tjänster

Svar 1-10:

3. Att frekvent introducera nya produkter eller tjänster

Svar 1-10:

4. Att experimentera med nya produkter och tjänster

Svar 1-10:

5. Förbättra kvaliteten på befintliga produkter och tjänster

Svar 1-10:

6. Att frekvent, men stegvis, modifiera och utveckla befintliga produkter

Svar 1-10:

7. Öppna och starta nya produkt/tjänstemarknader

Svar 1-10:

8. Öka stordriftsfördelar (economies of scale) av befintliga produkter eller tjänster

Svar 1-10:

### ***English translation***

To what extent (scale 1-10) are the following priorities within each unit?

#### **Existing Product Development**

*To what extent (scale 1-10) are the following priorities:*

1. Low costs on products and services

Answer 1-10:

2. To be first on the market with new products or services

Answer 1-10:

3. Frequently introducing new products or services

Answer 1-10:

4. Experimenting with new products and services

Answer 1-10:

5. Improving the quality of existing products and services

Answer 1-10:

6. To frequently, but gradually, modify and develop existing products

Answers 1-10:

7. Open and start new product / service markets

Answer 1-10:

8. Increase economies of scale of existing products or services

Answers 1-10:

#### **New Product Development**

To what extent (scale 1-10) are the following priorities:

1. Low costs on products and services

Answer 1-10:

2. To be first on the market with new products or services

Answer 1-10:

3. Frequently introducing new products or services

Answer 1-10:

4. Experimenting with new products and services

Answer 1-10:

5. Improving the quality of existing products and services

Answer 1-10:

6. To frequently, but gradually, modify and develop existing products

Answers 1-10:

7. Open and start new product / service markets

Answer 1-10:

8. Increase economies of scale of existing products or services

Answers 1-10:

### **Technology Development**

To what extent (scale 1-10) are the following priorities:

1. Low costs on products and services

Answer 1-10:

2. To be first on the market with new products or services

Answer 1-10:

3. Frequently introducing new products or services

Answer 1-10:

4. Experimenting with new products and services

Answer 1-10:

5. Improving the quality of existing products and services

Answer 1-10:

6. To frequently, but gradually, modify and develop existing products

Answers 1-10:

7. Open and start new product / service markets

Answer 1-10:

8. Increase economies of scale of existing products or services

Answers 1-10:

## Appendix 2 - Calculations for Innovation scale

### Answers from Head of R&D – Questionnaire

#### Exploitation questions: (Score formula: 10 – answer = Score)

1. Låga kostnader på produkter och tjänster
5. Förbättra kvaliteten på befintliga produkter och tjänster
6. Att frekvent, men stegvis, modifiera och utveckla befintliga produkter
8. Öka stordriftsfördelar (economies of scale) av befintliga produkter eller tjänster

#### Exploration questions:

2. Att vara först på marknaden med nya produkter eller tjänster
3. Att frekvent introducera nya produkter eller tjänster
4. Att experimentera med nya produkter och tjänster
7. Öppna och starta nya produkt/tjänstemarknader

Existing product development		New product development		Technology development	
1: 9	(10 – 9 = 1)	1: 9	(10 – 9 = 1)	1: 2	(10 – 2 = 8)
2: 5		2: 8		2: 5	
3: 2		3: 8		3: 3	
4: 2		4: 5		4: 10	
5: 10	(10 – 10 = 0)	5: 4	(10 – 4 = 6)	5: 2	(10 – 2 = 8)
6: 10	(10 – 10 = 0)	6: 2	(10 – 2 = 8)	6: 1	(10 – 1 = 9)
7: 1		7: 7		7: 10	
8: 9	(10 – 9 = 1)	8: 4	(10 – 4 = 6)	8: 2	(10 – 2 = 8)

**Score EPD:**  $(1 + 5 + 2 + 2 + 0 + 0 + 1 + 1) / 8 = 1.5$

**Score NPD:**  $(1 + 8 + 8 + 5 + 6 + 8 + 7 + 6) / 8 = 6.125$

**Score TD:**  $(8 + 5 + 3 + 10 + 8 + 9 + 10 + 8) / 8 = 7.625$

*English translation*

**Answers from Head of R&D - Questionnaire**

**Exploitation questions: (Score formula: 10 - answer = score)**

1. Low costs on products and services
5. Improving the quality of existing products and services
6. To frequently, but gradually, modify and develop existing products
8. Increase economies of scale of existing products or services

**Exploration questions:**

2. To be first on the market with new products or services
3. Frequently introducing new products or services
4. Experimenting with new products and services
7. Open and start new product / service markets

Existing product development		New product development		Technology development	
1: 9	(10 - 9 = 1)	1: 9	(10 - 9 = 1)	1: 2	(10 - 2 = 8)
2: 5		2: 8		2: 5	
3: 2		3: 8		3: 3	
4: 2		4: 5		4: 10	
5: 10	(10 - 10 = 0)	5: 4	(10 - 4 = 6)	5: 2	(10 - 2 = 8)
6: 10	(10 - 10 = 0)	6: 2	(10 - 2 = 8)	6: 1	(10 - 1 = 9)
7: 1		7: 7		7: 10	
8: 9	(10 - 9 = 1)	8: 4	(10 - 4 = 6)	8: 2	(10 - 2 = 8)

**Score EPD:**  $(1 + 5 + 2 + 2 + 0 + 0 + 1 + 1) / 8 = 1.5$

**Score NPD:**  $(1 + 8 + 8 + 5 + 6 + 8 + 7 + 6) / 8 = 6.125$

**Score TD:**  $(8 + 5 + 3 + 10 + 8 + 9 + 10 + 8) / 8 = 7.625$



## Appendix 3 - Interview questions

### **Bakgrundsfrågor:**

1. Vad är din position på företaget?
2. Hur länge har du arbetat i din nuvarande roll?
3. Vad har du för tidigare erfarenhet?
4. Vad har du för utbildning?

### **1. Diagnostic control systems**

Hur använder sig avdelningen sig utav budgetar och/eller prestationsmätningar? På vilket sätt? I vilket/a sammanhang? Exempel?

Följdfrågor:

- 1.1 För att identifiera faktorer som indikerat framgång med den nuvarande strategin?
- 1.2 För att sätta mål för att uppnå den nuvarande strategin? (Tas motivationen av anställda i beaktning i målsättningsbeslut?)
- 1.3 För att granska/bevaka framgången med den nuvarande strategin?
- 1.4 För att samla information vid eventuella avvikelser från förutbestämda mål?
- 1.5 Granska/undersöka viktiga prestationsområden?

### **2. Interactive control systems**

2.1 Hur uppmuntrar ledningen anställda att söka efter ny information utanför befintlig expertis?

- Hur vet den anställda detta?

2.2 Hur delas och sprids information om förändringar internt som påverkar verksamheten? (Vilka är med/i vilken konstruktion sker informationsutbytet?)

2.3 När nya action plans tar form, hur ser beslutsfattandet ut?

2.4 Hur arbetar er unit för att förutse eventuell framtida osäkerheter och risker?

2.5 Hur möjliggör top management ett samspel där verksamhetsinformation, antaganden och handlingar utmanas och diskuteras tillsammans med underordnade och kollegor? (alltså där ledning och anställda möts för att diskutera information för beslutsfattande)

### **3. Boundary control systems**

**3.1** Hur ni uttalade riktlinjer för hur man ska bete sig? (code of conducts)

**3.2** Hur ser policys, riktlinjer eller regler som bestämmer inom vilka områden experimenterande och sökande av nya möjligheter får ske? Eller gränser för hur detta får ske?

- Hur bestäms dessa riktlinjer, policys, regler och på vilket sätt följs de upp?

**3.3** Hur kommunicerar och informerar ledningen deras underordnade om vilka risker och handlingar som de ska undvika?

**3.4** Vad får anställda för konsekvenser som tar risker eller utför handlingar utanför avsatta gränser eller som går emot företagets policy?

### **4. Belief control systems**

**4.1** Hur ser företagets värderingar och vision ut och på vilket sätt är de dokumenterade?

**4.2** Hur kommunicerar ledningen företagets kärnvärderingar till de anställda/underordnade?

**4.3** Hur används formella dokumenterade värderingar för att engagera ledningen i den långsiktiga visionen?

**4.4** Hur används formella dokumenterade värderingar för att motivera och vägleda de anställda/underordnade till att söka efter nya möjligheter?

## ***English translation***

### **Introducing questions:**

1. What is your position in the company?
2. For how long time have you been working in your current role?
3. What is your previous experience?
4. What is your educational background?

### **1. Diagnostic control systems**

How does the unit use budgets and or performance measurements? In what way? In which contexts? Example?

### **Follow-up questions:**

- 1.1 To identify factors that indicate success with the current strategy?
- 1.2 To set goals to achieve the current strategy? (Is the motivation of employees taken into account in goal-setting decisions?)
- 1.3 To review / monitor the success of the current strategy?
- 1.4 To gather information of (potential) deviations from predetermined goals?
- 1.5 To review / investigate important performance areas?

### **2. Interactive control systems**

2.1 How does the management encourage employees to search for new information outside of existing expertise?

- How are the employees aware of this?

2.2 How is information about changes that affect the business shared internally? (Who is involved / and in what way does the information exchange take place?)

2.3 When new action plans take shape, what does the decision-making look like?

2.4 How does your unit work to predict any future uncertainties and risks?

2.5 How does top management enable interactions where business information, assumptions and actions are challenged and discussed together with subordinates and colleagues? (i.e. How and what does it look like when management and employees meet to discuss information for decision-making?).

**Boundary systems**

**3.1** How does the unit express guidelines for how to behave and act? (code of conducts)

**3.2** What are the policies, guidelines or rules that determine in which areas experimentation and search for new opportunities may take place? Or limits to how this can happen?

- How are these guidelines, policies, rules determined and in what way are they followed up?

**3.3** How does management communicate and inform their subordinates about the risks and actions they should avoid?

**3.4** What are the consequences for employees who take risks or perform actions outside the set limits or who go against the company's policy?

**4. Beliefs systems**

**4.1** What do the company's values and vision look like and in what way are they documented?

**4.2** How does the management communicate the company's core values to the employees / subordinates?

**4.3** How are formal documented values used to engage management in the long-term vision?

**4.4** How are formal documented values used to motivate and guide employees / subordinates to search for new opportunities?

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