



UNIVERSITY OF GOTHENBURG

# **Paradoxical Governance:**

## **A study of how CIOs combine innovation and efficiency through IT governance**

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# ABSTRACT

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With an increasing use of IT in organizations, it has become more important for CIOs to govern the IT department to support the firm with efficiency and innovation. Drawing from Organizational Ambidexterity (OA) and IT governance, this study explore how CIOs blend and balance innovation and efficiency through IT governance. This is done with a qualitative approach interviewing renowned CIOs from large organizations in Sweden. Our findings indicate that employing blend strategies are more effective from a long term perspective while also being applicable in most scenarios. Furthermore, the result indicates that cases of using both structural and contextual OA are a common and good way of achieving OA in organizations. The most prevalent contextual approach for OA is to educate employees. Education leads to raised motivation, improves thinking and most important: decision delegation becomes more feasible, making use of more competence while lowering the workload on executives. The findings of this study reveals, for the first time, how paradoxes can be resolved to achieve OA in an IT context. Limitations and future research are also discussed.

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**Keywords:** *Organizational Ambidexterity, Innovation, Efficiency, Paradoxes, Chief Information Officer, CIO, IT Governance*

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# 1. Introduction

In organizations, investments in IT have shown to be a key contributor to increase productivity (Kleis, Chwelos, Ramirez & Cockburn, 2012; Melville, Kraemer & Gurbaxani, 2004), to achieve business growth (Upton & Staats, 2008) and subsequently creating competitive advantage (McAfee & Brynjolfsson, 2008; Weill & Ross, 2004). Clearly, IT is a significant part of the business and constitutes a substantial cost. Also, Saunders and Brynjolfsson (2016) claims that IT investments constitutes more than 30% of the annual capital investment of many enterprises.

A majority of business executives are aware of the increasing impact of emerging digitalization and are eager to implement transformative technology in their organizations (Fitzgerald, Kruschwitz, Bonnet & Welch, 2014). By doing so, IT can contribute to competitive advantage, ensuring that the organization retain its market shares. The possibilities of digitalization are many, including improved customer experience, streamlined operations and innovation of products (Fitzgerald et al. 2014; Upton & Staats, 2008). New technologies as cloud computing and software as a service (SaaS) delivery models makes it easier than ever to swiftly try and implement new solutions and innovating the business (Brynjolfsson & Schrage, 2009). Furthermore, the speed of innovation is even more pushed forward by recombining a number of small and specialized programs in creative ways (Bygstad, 2015).

The path towards new technology is unfortunately not without obstacles; major obstacles include a shortage of knowledge and legacy systems that does not support new technology (Feld & Stoddard, 2004; Fitzgerald et al. 2014; Tiwana & Kim, 2015). To overcome these obstacles, the organization could spend its resources to let the co-workers educate themselves about new technologies. Alternatively, they could turn to consulting firms which are being eager to sell their services to develop digitalization. No matter which of these options the organization act on, the outcome of such investments are more or less unsure; it is complex to evaluate the effects of technology that is yet to be tested in the organization (Lundberg, 2009). Therefore, the organization need to consider whether they should accept the risk of breaking new grounds, or spend their resources on incrementally improving existing solutions.

By implementing a variety of solutions, the complexity of the IT infrastructure increases, making it significantly harder to ensure integrity of information and agility of the IT department (Feld & Stoddard, 2004). Furthermore, with a strong focus on innovation, there is a risk that investing in renewing old infrastructure is overlooked. Over time this can be problematic since modern infrastructure is more cost effective and also a foundation of evolving technology (Feld & Stoddard, 2004; Henfridsson & Bygstad, 2013).

## 1.1. Utilizing Information Technology

Because of the increased size and importance of the IT department in many modern organizations, it has grown more complex. Plenty of different types of decisions need to be

made, both on a daily basis and for long term planning. This result in a demand for governance structures geared explicitly towards IT. One of the most recognized and established framework for IT governance is Weill and Ross (2004) framework of decision making. They identify five domains in which decisions take place to support CIOs. These are: IT principles, IT architecture, IT infrastructure, application needs, investments and prioritizations.

As stated above, whether to improve existing solutions or try new technologies is a crossroad. Although, having positive effects of both efficiency gains and innovation would be beneficial for most organizations, previous research focus on when to strive for what rather than how to achieve both. An example of this is the work of Xue, Ray and Sambamurthy (2012) where a series of hypotheses are confirmed. Their study show that in organizational environments with lesser complexity, dynamism and possibilities for growth, IT investments primarily leads to efficiency gains. While organizations with a great number of diversified external actors are more likely to develop innovation from IT investments.

More recently, a study by Mithas and Rust (2016) shows that organizations with an emphasis on both cost reduction and revenue growth achieves the same profitability as its competitors with an single-emphasis IT strategy. At the same time, firms with a dual-emphasis benefits more from its IT investments and have a higher market value. Mithas and Rust (2016) clearly shows the benefits of a multi faceted IT strategy. Furthermore, they conclude that their findings would be of use for IT executives developing IT strategies; Although, they do not contribute with solutions how to reach such a state. The ability to simultaneously pursue contradictory goals requires some paradoxical solutions and is nothing but easy (Gregory, Keil, Muntermann & Mähring, 2015; Mithas & Rust, 2016).

## **1.2. Ambidexterity**

An analogy to our biological self being ambidextrous (i.e. the ability to be equally versatile with both hands) introduces the concept of organizational ambidexterity (OA) which has emerged as a new research paradigm (Raisch & Birkinshaw, 2008). The theory of OA suggests that an organization is not bound to make trade-offs between exploiting and exploring activities (March, 1991), but can instead exist in a state where both are simultaneously achievable (Tushman & O'Reilly, 1996). The notion of an ambidextrous IT department is therefore enticing, thus it would open up for the possibility to support innovation (i.e. exploring) while also being more efficient (i.e. exploiting).

Unfortunately for researchers and IT executives, there are no best practices of how to be ambidextrous. Depending on which type of organizational context OA need to be achieved, different paradoxes have to be resolved (cf. Andriopoulos & Lewis, 2009; Gregory et al., 2015.) Previous research in the field have focused on OA from an organizational perspective such as organizational learning (Cegarra-Navarro & Dewhurst, 2007), R&D (Hoang & Rothaermel, 2010) and HR (Patel, Messersmith & Lepak, 2013). In a recent contribution within an IT

context, Gregory et al. (2015) conducted a longitudinal case study of a merger between two banks where they explicitly studied the merger of the IT departments. In the study, a series of paradoxes are identified specifically for an IT context where decisions are made regarding how to build up shared IT in a new organization. Managers need to balance between decisions whether the IT department should deliver short term benefits (i.e. exploiting), or long term benefits (i.e. exploring) to the organization (Gregory et al., 2015).

### **1.3. Research question and purpose**

Apart from the work of Gregory et al., (2015), the extant literature have limited previous research on OA within the information systems (IS) discipline (Gregory et al., 2015; Raisch & Birkinshaw, 2008). Furthermore, Gibson and Birkinshaw (2004) calls for research of how executives conduct their work to help create OA. Building on this, the purpose of this study is to further contribute to the field of OA in an IT context by developing theories about how CIOs can perform to achieve an ambidextrous state. This results in the following research question:

*“How do CIOs blend and balance innovation and efficiency through IT governance?”*

We will therefore use Weill and Ross (2004) IT governance domains of decisions to structure our problem area. In these domains, we will use the six paradoxes identified by Gregory et al. (2015) to examine concrete issues with OA in the IT context. We aim to examine the view of CIOs through semi-structured interviews to develop a picture of how and where OA can be achieved through IT governance.

This thesis is structured as follows: First, we present theories regarding OA and IT governance as well as our theoretical approach to define balancing and blending, this to get a clearer theoretical understanding of our study. Second, we describe our research approach and design to uncover how we will answer our research question. Third, we present our findings by presenting succinct quotes from our data to show major patterns. Fourth, we discuss our results in relation to theory and discussing future research, limitations and implications. Finally, we conclude by presenting our major contributions.

## 2. Theoretical Foundation

Our theoretical foundation presents a theoretical lens for studying OA with an IT governance perspective. To understand why blend and balance are important, we first need to make clear how ambidexterity can be achieved in organizations to manage innovation and efficiency. Thus, the first section of this chapter will present the theoretical background of ambidexterity and how it relates to an IT context. The second section presents theories about blend and balance, those are important in order to understand how OA can be achieved. In the third, and last, section we present theories about IT governance and the role of the CIO. The reason to put IT governance last is that we find it important to first grasp our view of OA to then understand our perspective on IT governance.

### 2.1. Organizational Ambidexterity

In this section, we will describe the theoretical background of organizational ambidexterity (OA), and how different configurations can be used to achieve OA. In addition, we will also describe how OA appears in an IT context and which paradoxes that are relevant for governing an IT department.

Organizations usually struggle to make trade-offs between exploring and exploiting activities (March, 1991). By exploiting already existing solutions within an organization benefits such as optimization, efficiency gains and refinements can be achieved. Exploiting is positive for the performance in the short term, and the effects are also predictable. On the other hand, exploration activities leads to innovation, new customers and organizational flexibility. Exploration is positive for long term performance, but the effects are not as predictable and can initially be negative for the performance (ibid). March (1991) addresses this as a paradox where the abilities contradict each other, the organization need to be aware of the paradox in order to make well informed trade-offs suiting their business. Furthermore, March (1991) suggests that the firm should develop the two strains simultaneously.

Tushman and O'Reilly (1996) further elaborates the paradox of simultaneously exploring new technologies and exploiting existing ones. In order to do so it would require strategies for parallel operations, otherwise the risk of failing is eminent. Without parallel strategies, conflicts can occur between different needs of improving existing business operations or developing entirely new ones. Parallel strategies however, are bound to deal with difficult paradoxes such as: achieving alignment between culture, strategy and people while being interrupted by quick needs of organizational change. To overcome this, Tushman and O'Reilly (1996) proposes the capability of ambidexterity. An ambidextrous manager has the ability to lead an organization for parallel exploitation and exploration. Following this, Tushman and O'Reilly (1996) claims that almost all relatively wealthy firms can afford to explore new technologies. In more recent work, Cao et al. (2009) finds that wealthy firms indeed are more prone to achieve OA without making

trade offs. Furthermore, Smith et al. (2016) claims that with leaders that venture in spending more on innovation will receive efficiency gains later on due to the generative effects of IT. Hence, OA can be reached also with lesser resources than previously known (Smith et al., 2016).

In the path towards OA, older organizations often faces more impediments than younger ones because over time organizations develop complex alignments between its activities, people and supporting facilities. This leads to cultural and structural inertia, hindering the organization from changing its business when it needs to (Tushman & O'Reilly, 1996). Tushman and O'Reilly (ibid) addresses a cultural paradox as the main issue due to the fact that cultures are hard to change and have a big influence on the workforce's ability to either strive for improvements or cultivate new routines. Also, Tushman and O'Reilly (1996) expresses complications with changing the structures that obviously made the business profitable; to find a balance between the old and the new lines of work is a success paradox.

### **2.1.1. Organizational Ambidexterity Configurations**

To elaborate over and understand OA in a more practical manner, Gibson and Birkinshaw (2004) describe two different configurations for an organization seeking ambidextrous capabilities. The first option, called structural ambidexterity, is achieved through a separation of business units, each specializing in either explorative or exploiting activities (Gibson & Birkinshaw, 2004). For example, if an ERP consultancy firm would implement structural ambidexterity, they would split the sales office in two units, one of them focusing on developing the relationships with existing customers, while the other unit focuses on acquiring new accounts. The idea of separating the organization in different tracks and thereby bypass the need of making trade offs between exploring and exploiting activities was later embraced by the leading IT industry analytics firm Gartner (Mesaglio & Mingay, 2014). In 2014, Gartner coined “bi-modal” IT as a solution to the growing need of incorporating agile innovation. According to Gartner, new technologies differs substantially from traditional systems in terms of agility, flexibility and time to market (Mesaglio & Mingay, 2014). This is further explained by Bygstad (2015) arguing that lightweight IT possibly enhances both the speed of innovation and, maybe more important, brings innovation closer to the end user. Therefore the organization will do best by controlling emergent technology with a mode 1/mode 2 separation (Mesaglio & Mingay, 2014); mode 1 controls innovation and the the latter focuses on maintenance and development of core legacy systems. By this manner the organization becomes ambidextrous through explicit creating structures where the needs of IT can be nurtured without negatively affecting each other.

The second option proposed by Gibson and Birkinshaw (2004) is called contextual ambidexterity; instead of specialized business units, the ambidextrous abilities are permeated in the entire business unit. To achieve this, Gibson and Birkinshaw (2004) suggests that management supports the workforce in making their own decisions when choosing in between exploring or exploiting (e.g. acquire new customers or working with existing accounts).



Contextual ambidexterity is more associated with cultural aspects than structural is. This is also recognized by Tushman and O'Reilly (1996) which emphasizes the importance of shared visions, a common culture and leaders that supports ideas deriving from their co-workers. Achieving such context from a leader's point of view requires that the thoughts and ideas of the leader are transferred and promoted throughout the organization. In their work studying how organizational contexts and managerial actions interrelate with each other, Ghoshal and Bartlett (1994) identifies four separate aspects making this transition of thought possible. The aspects are: (1) Discipline, by introducing clear standards that coworkers can commit to, combined with fast consistent feedback, the organization's members can more easily reach goals on their own behalf. (2) Stretch, by encouraging the employees to reach for higher goals and establish shared ambitions the feeling of individually contributing to an overall purpose rises. (3) Support, by letting co-workers access resources and using their time helping others by their own initiative, the ability of stretch is further enhanced. (4) Trust, by staffing positions with the most suited personnel and involve affected people in decision making, co-workers can more easily rely on each other's commitment.

Even though these aspects are not initially created to explain the development of OA, they are recognized by Gibson and Birkinshaw (2004) as factors being common in organizations demonstrating contextual OA. Furthermore, in their study Gibson and Birkinshaw (2004) realizes that the aspects are more prominent when aggregated to two factors (discipline/stretch and support/trust) rather than four.

Whether to implement structural or contextual ambidexterity is a question identified by Raisch, Birkinshaw, Probst & Tushman (2009) as a tension that remains unresolved. Since Gartner's idea of bi-modal IT has met some criticism of practitioners for being a simplified solution for a complex problem perhaps it is not enough for achieving OA (Bloomberg, 2015; Boulton, 2016). At the same time, Gibson and Birkinshaw (2004) have some criticism for contextual OA meaning that it is simply not enough for raising performance, the capacity created by contextual OA also has to be leveraged. The debate whether to strive contextual or structural OA is closely related to whether the ambidextrous ability relies on the individual or organizational capabilities (Raisch et al., 2009). Deriving from these insights, implementing a mixture of the different types of OA should be more prosperous for the organization while meeting the diversified requirements of the different part of the organization.

### 2.1.2. Ambidextrous Paradoxes in an IT Context

Depending on the type of organizational function in which ambidexterity is applied, different paradoxes challenge the managers. In a longitudinal case study by Gregory et al. (2015) the transformation of an IT department is the object of interest. In the study, six different paradoxes are identified that influences the IT department's ability to either contribute to existing projects, or contribute to long term business transformation.

Paradox	Description
IT efficiency vs IT innovation	Whether to reduce costs for short term gains, or innovate for long term competitiveness.
IT standardization vs IT differentiation	Whether to strive for harmonization and consistent use of IT, or focus on customization and flexible adaption of IT.
IT integration vs IT replacement	Whether to focus on reusing and integrating new solutions with existing IT, or rather renew and replace existing IT.
IT program agility vs IT project stability	Whether to being responsive to strategic and contextual changes, or ensuring a stable foundation for IT.
IT program control vs IT project autonomy	Whether to encourage alignment between IT project goals and solutions or give IT projects enough leeway to address local requirements.
IT program coordination vs IT project isolation	Whether to coordinate multiple projects, or letting them go on autonomously.

*Table 1: the six paradoxes identified by Gregory et al. (2015).*

## 2.2. Theorizing Balance and Blend

In this section we will present strategies for achieving OA (whether it is contextual or structural). First, we theorize how a balance situation is achieved, and what effects this have on the organization. Then, we theorize how blend is achieved, and why this differs from balance.

Intuitively, to balance between exploring and exploiting activities is seen as an example of OA (March, 1991). Finding a suitable balancing position requires thorough knowledge about the unique needs in a specific situation. Therefore, if a balance between exploring and exploiting is reached, it is perceived as the organization is achieving OA. But this is not the only configuration for OA, since some sort of trade off between explore and exploit is still made (Cao, Gedajlovic

& Zhang, 2009). Balanced OA is problematic in an ever changing environment where the most suitable balance will change over time, and the organization is still not able to explore and exploit simultaneously (Cao et al., 2009; Smith, Lewis & Tushman, 2016). To demonstrate this further: imagine a balancing board where the organizational need to explore/exploit is represented by the tipping point. When the need is altered, the weight of explore/exploit changes and the tipping point must move along a continuum to maintain balance. Ergo, a trade off between explore/exploit is made to suit the organization just now.



*Figure 1: Illustration of balancing organizational ambidexterity.*

To pursue exploiting and exploring activities without making trade offs is a, perhaps more refined, type of OA (Cao et al., 2009). By doing so, a business unit can receive the benefits of both sides of the paradox (Gregory et al. 2014; Smith et al., 2016; Tushman & O'Reilly, 1996). Still, in some cases organizations must make trade-offs between the two, and depending on the context and the type of paradox either blend or balance is to prefer (Gregory & Kiel, 2014; Gregory et al., 2015). In a case study of multiple chinese companies, Cao et al. (2009) addresses two parallel tracks within OA theory: (1) a balancing dimension (from now on called balance) which means to strive to either explore/exploit on behalf of the other, as demonstrated above; and (2) a combined dimension (from now on called blend) which means that both explore and exploit is conducted simultaneously without compromising each other. Furthermore, Cao et al. (2009) means that both balancing and blending are examples of OA, depending on what theoretical background that is used.

In a recent study, Smith et al. (2016) proposes the idea that executives in organizations should employ “Both/And” (i.e. blend) approach instead of a more traditional “Either/Or” (i.e. balance) mindset. Organizations have been trying consistently to focus on either side of the balancing board which in turn triggers the demand for the other. Instead, with paradoxical leadership, organizations can enter a state of dynamic equilibrium where leaders cope with change rather than fight it to balance.

## 2.3. IT Governance

To be able to study OA in an IT context, we use the construct of IT governance to define our area of study. In this section we first introduce IT governance, second we present IT governance domains of decision where we investigate ambidexterity and third, we describe the relation between IT Governance and the role of CIO.

Drawing on the same principles as corporate governance, IT governance is an area of study that was first introduced in the early 2000's as a reaction to the rapid increase in capital expenditure on IT and the increasingly important role of IT in the organization (Saunders and Brynjolfsson 2016; Weill & Ross, 2004). In combination with this, researchers such as Weill and Ross (2004) presented findings that organizations which employed an IT governance strategy had better results than those which did not. Since then, IT governance has been branched out and an array of definitions have been used. Some definitions concentrate on alignment between business and IT (Van Grembergen, 2002); others concentrate on decision rights and accountability (Weill & Ross, 2004; Sambamurthy & Zmud, 2000). In this study, we use Weill and Ross (2004, p8) definition of IT governance as follows:

*“IT governance: Specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT”*

We chose this definition because it gives us the best opportunity to answer our research question. This definition implies that IT Governance has the potential to create and change preconditions for the structure of decisions and accountability. This in turn, creates the setting in which ambidexterity can be studied in. Further, in relation to this definition, Weill and Ross (2004) structure five governance domains in which decisions can be made. These are: IT Principles, IT Architecture, IT Infrastructure, Business Application Needs, IT Investment and prioritization. We use these domains to get a better understanding of where, how and why CIOs do or do not blend and balance in an IT context. Next we describe Weill and Ross (2004) five IT Governance domains in more detail.

### 2.3.1. IT Governance Domains

**IT principles:** *high-level decisions about the strategic role of IT in the business.*

In order to create a framework in which IT decisions can be made, a small number of principles, expressing how the organization make use of IT is developed. When the principles are expressed and communicated throughout the organization they can be discussed and further evaluated, making them a part of the management decision support structure. The principles must address how the organization should operate and how IT is supposed to support operations. This ensures that decisions for IT investments incorporate the business requirements and helps to clarify future architectural and infrastructural needs. The principles must also stipulate how the cost of IT should be covered, the costs can either be centrally subsidized or effect single business

units. The funding model influences whether enterprise-wide synergy effects or operation effectiveness of single business units is more important.

**IT architecture:** *an integrated set of technical choices to guide the organization in satisfying business needs.* Based on IT principles, IT architecture is defined as “The organizing logic for data, applications and infrastructure, captured in a set of policies, relationships, and technical choices to achieve desired business and technical standardization and integration”. (Weill & Ross, 2004) Integration and standardization is therefore the two main foundations for specifying the IT Architecture: Process integration allows multiple business units to be part of a single process. Standardization of processes and data enables integration across the organization to achieve consistency and a single way of doing things. Flexibility is also of importance that need to be built in an architecture to be able to meet business needs (Weill & Ross, 2004).

**IT infrastructure:** *centrally coordinated, shared IT services providing the foundation for the enterprise’s IT capability and typically created before precise usage needs are known.*

Weill and Ross define this domain as follows: “IT Infrastructure is the foundation of planned IT capability (both technical and human) available throughout the business as shared and reliable services and used by multiple applications”. Good infrastructure enables rapid implementation of future business initiatives as well as consolidation and cost reduction of current business processes.

**Business application needs:** *business requirements for purchased or internally developed IT applications.* This domain is concerned with decisions that specify different business needs to generate value. When identifying business application needs, two different perspectives contradicts each other making it hard to fulfill both goals simultaneously. The first is creativity, this is about finding new and more effective ways to meet the demands by facilitating experiments and supporting strategic business objectives. The second perspective is discipline, which is about keeping the integrity of existing architecture by making sure that new applications meet existing architectural principles and also dedicating the required resources to reach business goals.

**Prioritization and investment:** *decisions about how much and where to invest in IT, including project approval and justification techniques.* In this domain, three core objectives have to be addressed in order to evaluate whether to invest or not. The first being how much should be spend? Often organizations use benchmarking against the industry to evaluate whether they spend a proper amount of resources on IT. But the most successful organizations makes a more thorough estimations by comparing the expenditure to their unique strategies.

The second objective is how to allocate IT expenditure? With an IT portfolio managers can obtain an overview of the existing IT solutions. This makes it more straightforward to balance the projects to fit business strategies when choosing between creative and disciplined IT

investments. By comparing the portfolio with industry benchmarks more well informed decisions can be made when the economic climate changes and realignment of IT and business strategies is needed.

The third objective is how to reconcile differing needs? In an enterprise the requirements of IT often differ significantly between business units. When trying to implement solutions that integrate and spans over multiple units resistance amongst the workforce is often met when they need to compromise with their unique needs. To overcome the resistance business leaders must communicate the enterprise's objectives and create an understanding for the importance of shared infrastructure to gain synergy effects and support seamless information sharing.

#### **2.4. IT Governance and the CIO**

Chief Information Officer (CIO) is a key actor related to IT Governance (Banker, Hu, Pavlou & Luftman, 2011; Magnusson & Bygstad, 2013). This role is characterized by Broadbent and Kitzis (2005) as the most senior executive for identifying information and technology needs and then delivering services to meet those needs. The role of the CIO is also described as a very demanding one, they struggle to govern a critical business unit but still continuously has to prove its viability (Heller, 2013; Magnusson, 2010). In addition, the CIO is the only C-level executive that is commonly not a part of the board which puts the IT in a lesser position of power in relation to the business (Broadbent & Kitzis, 2005). Instead, the CIO often report either to the CFO or CEO. The reporting structure which is most beneficial for an organization depends on what kind strategy the firm is undertaking; with a cost leadership positioning the CIO-CFO is prevalent, for a differentiator positioning CIO-CEO is prevalent (Banker et al., 2011).

### **3. Research Method**

In the discipline of Information Systems (IS), the human organization is one of the most common areas of research (Avgerou, 2000; Sidorova, Evangelopoulos, Valacich & Ramakrishnan, 2008). Avgerou (ibid) further describe that in organizations, IS research regarding management are concerned with topics such as the formation of strategy; aligning information systems with business goals; and using IT to achieve desirable organisational change. These are all topics close to our research taking a governance perspective on the organization. In this IS study, we have the ambition to empirically develop an understanding and explain how CIOs blend and balance innovation and efficiency through IT Governance.

To make this possible, we build our study with a qualitative approach. Since there is an absence of theory in the extant literature suitable to answer our research question (Gregory et al., 2015), we use a qualitative approach to answer “how” and “why”, rather than “how many” used in quantitative research (Silverman, 2010). Also, we use a qualitative approach to develop a deeper understanding over our research setting, which in our case is an organization's governance of information systems (Patel & Davidsson, 2011). Based on this, we use semi-structured interviews (Silverman, 2006) to collect CIO's experiences and views. The goal of our study is to develop theories in order to answer our research question. By conducting qualitative interviews, we can develop deep knowledge of a few cases in order to build our theory based on causality (Esaiasson, Gilljam, Oscarsson & Wängnerud, 2007). We explore and uncover instances of when they blend and balance innovation and efficiency while governing the IT department. After this, we analyze the instances to discover major patterns, and how they relate, for blending or balancing innovation and efficiency.

To present how we have designed our study more in depth, this chapter is structured as follows: First we present our research setting and the selection of our respondents. Second we describe how we use semi-structured interviews to collect data. Third, we describe how we have analyzed our data.

#### **3.1. Research setting and sample**

In our study, we have focused on large organizations to be able to find the type of data needed for this study. Large organizations contain a level of structure and complexity needed to study IT governance and OA. We have also limited our study to swedish organizations to have a better understanding of culture, language and hierarchy philosophy (McCracken, 1988). In these organizations, we chose to study CIOs for the reason that he or she has the most broad and thorough understanding how a business and IT department is governed and functions.

With strategic selection (Esaiasson et al, 2007), we chose CIOs that have been nominated for “CIO of the year” in Sweden during the previous two years, 2014 and 2015 (CIO Sweden, 2016a; CIO Sweden, 2016b). All 10 nominees represents large organizations (>1000 employees) and mostly different industries. We argue that this is a well suited group to answer our research question because they have been recognized for being competent and at the forefront to govern their IT department in their respective organization. Another rationale behind our sample is that by interviewing CIOs that are explicitly appreciated for their competence, the chances are higher that they are aware of the concepts such as bi-modal IT (Mesaglio & Mingay, 2014). Perhaps, even working with them in mind.

Our initial sample were constituted by ten nominees, seven accepted and became our respondents. Unfortunately, two interviews got rescheduled and had to be delayed which resulted in that only five out of seven interviews were used for analysis due to our timeframe. Despite this, we consider that our sample is rich enough to draw conclusions from. This since during our analysis, we found patterns in all five domains containing examples of contextual OA, structural OA and both blend/balance.

To not compromise the anonymity of our respondents, we describe further descriptive statistics of our sample in averages: The final sample constituted of CIOs with an average work experience of 7 years at current position, and a total of 13 years of experience as CIO during their whole career. The organizations connected with the CIOs had an average of 1620 employees in a variety of sectors, both public and private.

### **3.2. Data collection**

As stated earlier, we used semi-structured interviews to collect our data, we chose this method for several reasons. First, the data required to answer our research question are complex. With semi-structured interviews we can get an understanding of our respondents through their experiences and views that would be difficult to understand through other methods such as surveys or documents (Silverman, 2006). Second, since it is common that organizations are in constant transformation, policy documents are rarely up to date, there is also a risk that the policies are not practiced (Orton & Weick, 1990) which would lower the validity of this study. Although, a weakness in our study is the inability for triangulation, something policy documents would enable, which lowers the validity of our study. Despite this, we have chosen to not use documents, mainly for our timeframe limitation.

We initiated our data collection by sending out invitations to participate in our study by email and communicating the purpose, what they could contribute to, and that they would be able to partake in our results after the study was complete. We did one face-to-face interview and six remotely via phone and video calls. Every interview was between 40-60 minutes in length and was recorded and transcribed with their permission.



To achieve a structured and a clear objective of the interview we constructed a semi-structured questionnaire, with themes to help us cover all of the areas of interest in the same order for (McCracken, 1988). The same questionnaire was used for each respondent. The themes covered was based on Weill and Ross (2004) domains of IT Governance to get a complete picture of our problem area where OA is created. The five themes are: IT principles, IT Architecture, IT Infrastructure, IT Applications and Needs and lastly Investments and Prioritizations. To create interview questions within each theme, we used paradoxes identified by Gregory et al (2015) to enable us to find concrete problems and solutions where balancing or blending can occur.

In this study, we view and treat our respondents answers as a description of their reality to describe facts and events (Silverman, 2010). To address validity, this assumption enable us to strengthen the notion that it is the CIO's reality we are investigating and not an organization as a whole. We addressed this further by asking if they perceive a difference between theirs, and the organization's view on IT, then we explicitly requested the respondents to answer from their point of view.

### **3.3. Coding and analyzing collected data**

When all data collection was complete we started to analyze our data by creating a coding scheme where we used code groups of balancing, blending, paradoxes and domains. Then we created subcodes for each paradox from Gregory et al (2015) and each IT governance domains from Weill and Ross (2004). These groups were used to identify instances of each code in the transcribed material manually. A general weakness with coding is that every way of seeing is also a way of not seeing (Silverman, 2010). Coding schemes limit researchers within a conceptual frame, we therefore do not solely code deductively, instead we kept an open mind to inductively find patterns of different instances of blend and balance.

To discover our patterns, we used a computer assisted software for qualitative research to digitally code our data. We iterated through each question vis a vis answer and tagged it with the appropriate codes. By tagging each selected quote with at least one paradox, one domain and either a balancing or blending approach, patterns emerged during our analysis which could be used to answer our research question. This digital approach enabled us manage quotes in a secure and structured manner. Also, we were able to try multiple queries on the data to investigate multiple complex patterns.

## 4. Results

To present the result in a clear and systematic manner we use the five domains of IT governance to structure the result, each domain represents its own section. Also, this is the most natural structure, whereas different activities and patterns emerge depending on which domain that are studied. Within each section of the result, our findings are separated in blend and balance. By doing so, coherent and easy to understand patterns reveal themselves, making it possible to relate the result to our research question. Each of the following five sections begins with a recapitalisation of the domain and a presentation of the major patterns. Then, we present more detailed reflections and quotes from our interviews.

### 4.1. IT Principles

In this domain, IT principles are created to support the framework in which IT decisions can be made (Weill & Ross, 2004). Our data demonstrate that common goals and delegating decisions further down the hierarchies are means for CIOs to blend efficiency and innovation. On the other hand, restricted resources is a factor that often requires CIOs to balance between both. The most frequent paradoxes within IT principles are IT innovation vs IT efficiency and IT program control vs IT program autonomy.

#### 4.1.1. Blend

Respondent B illustrate ambidextrous capabilities through a separation of Production IT and Agile IT. By doing so, the first part of IT is viewed as a factory with a sturdy, constant delivery and at the same time, the second part of IT has an experimental approach where new solutions are frequently tested.

*B: We employ two-stroke IT. This is essential to us, because there is a tension that you need to be efficient with IT, that is apparent, we call it IT Production [...] Then we have the more experimental IT which is the Agile IT. I usually say absolutely, there is a tension between them and we have solved it with two-stroke IT. IT Production is robust and then we have the lab environment where we do experimental IT.*

In contrast to the two-stroke approach, respondent D argue that it is important to avoid the risk of a silo mentality where employees fight to optimize their own domains at the expense of others.

*D: But then it is, the requirement is that also those taking decisions further down in the organization still understand and think unity to not start suboptimizing, to build silos, to start fight against each other.*

Instead, respondent D encourage the employees to understand the bigger picture, decisions can be made that is beneficial for more stakeholders. Additionally, respondent E emphasizes the importance of shared common goals which all employees are aware of and can use as a benchmark. When a situation where common goals and shared visions are achieved, subunits in the organization can become more autonomous.

*E: We have a clear, globally spanning picture, of what we want to achieve, also we organize all units to take decisions autonomously. We give humans full freedom to make decisions and a large mandate to act when we let go of the power in many ways, we contribute with goals but gives humans mandate to act.*

*D: Yes it is about to build and organization that fits, through establishing clear goals of what to achieve, both for customers but also internally, so that everyone have a shared picture. but also internally so that everyone have the same vision.*

Consequently, the effects of these decisions result in both innovation and efficiency without contradicting each other.

#### **4.1.2. Balance**

In some cases in our data, the structure that is built through IT principles prevent the organization from becoming ambidextrous. CIOs show signs of a balancing approach when resources prevent the combination of efficiency and innovation. Instead, they have to prioritize in different scenarios to make decisions. Respondent C, D and E illustrate this as follows:

Respondent C describes a scenario where resources are the limiting factor where decisions have to be made whether to aim for exploring or exploiting investments instead of both.

*C: Resources, whether it is money or people they are not infinite, they are clearly limited. This means that we must look at it from a firm perspective, what is most important for the firm? Where can we get the most and quickest effect out of the money we invest? We need to look at the bigger picture put simply.*

This is in contrast to what respondent D believe, which state that IT always need to be viewed upon from a long term perspective. Still, respondent D express that it is important to find a balance of investments that is suitable for the organization's needs regarding innovative techniques or other requirements.

*D: So it's all about trying to find a level where together, we help each other to prioritize the right things, both long term and short term. And it is my job to point out the long term solution, because IT cost money in the long term, not short term.*

*D: We try to have a number of categories, a balanced portfolio. One has to weigh them against each other: What is most important right now? Customer value, the latest technology, legal requirements or cost efficiency? [...] Then we balance it against a budget, to see what we can afford, what we can do this year. Should we invest in more technology or more customers?*

Respondent E uses another perspective on balancing between long and short term benefits. Since every system in some way forces the organization's processes to fit the systems logics, when procuring for new solutions, the organization must be aware of this aspect in order to find the best balance of constraints or creative freedom.

*E: Any type of system entail a type of rut to follow, you have to know which degrees of freedom an organization need and have to maintain to enable creativity when implementing a process with the help of a system. This is because that systems have a rectifying effect, and it is good sometimes and bad sometimes regarding all kinds of tools. It comes down to what you want to achieve before choosing to implement something.*

## **4.2. IT Architecture**

This domain is defined as an integrated set of technical choices to guide the organization in satisfying business needs (Weill & Ross, 2004). Most frequent paradoxes are IT Integration vs IT Replacement and Standardization vs Differentiation. In this domain, results indicate that CIOs achieve ambidexterity by structuring different roles, competences and business units to focus on innovation and efficiency separately. Other means to achieve this is to plan financially for a blended approach or be information-centric. The most expressed scenario of balance is between to compromise and not compromise the architecture for new innovations.

### **4.2.1. Blend**

Respondent B imply that both a solid architecture and agile development are important. By having a structure where experiments can be conducted in a lab environment, the risk of compromising with the integrity of the architecture is circumvented. This result in that they can first evaluate whether the new solution is viable or not, then make a decision to implement it full scale or not.

*B: If there is something we want to test quick and easy, then we don't need to do it very robust. Instead we try as in a lab, and then it can be that it doesn't at all, but then when we see that this works, then we build it into our more robust architecture*

To support this, respondent D describes a configuration where they split different roles and competences within the architecture domain. In this case, the CIO work as an intermediary to convert potential friction into a constructive mix of innovation and efficiency.

*D: [...] it is because we have people that really has other tasks, some have a task that it is stable, safe, secure, legally correct and so forth and som has as assignment to be creative, innovative and to question. Between these groups or competences friction always occur, and then it is my job to point this friction in a creative direction, and not destructive.*

Respondent A blend efficiency and innovation by having a proportion of the budget to further develop their architecture. This result in a standardized and efficient architecture with the latest innovative technology solutions.

*A: We have remodelled our whole environment, we have a really modern Microsoft environment. We made a really big migration a few years ago that we constantly keep on expanding. We have money set aside in the budget each year to continuously change it. I would say that we are current there.*

Respondent E represents a different point of view when governing the architecture. By starting from the information that is handled by the systems they can be highly efficient while adjusting the architecture to fit their needs.

*E: We always take stance from the information's structure yes, always always always. [...] And that make us hyper effective when solving conceptual problems and leading change.*

#### **4.2.2. Balance**

In the architecture domain, we have also found instances where balancing is apparent.

Respondent B explain that it is necessary to balance between the robustness of the architecture and new innovations. Investments must have a strong business case if the architecture would be compromised, conscious decisions in relation to the architecture board are needed to achieve this balance.

*B: Must balance between standardization or to exchange. [...] is it a solution that differs from standard, you simply need a dispensation. And like that we make informed decisions, that it is okay because of a strong case. Yes, simply informed decisions.*

Respondent E also points out that a balance between standardization and innovation is needed. Furthermore, if an investment or change is motivated, it has to be assessed.

*E: But we never standardize as far that we can no longer question it, or conceptually consider a atypical solution. Quite the opposite I stated in the strategy earlier in 2004: the right to diverge when it can be motivated -but it has to be motivated. It has to be tried.*

*E: We have sufficient amount of standardization to be effective, and sufficient freedom to constantly develop knowledge. Which is a necessary balance [...]*

### **4.3. IT Infrastructure**

IT Infrastructure is the foundation of planned IT capability (both technical and human) available throughout the business (Weill & Ross, 2004). The paradoxes found in this domain are IT Innovation vs IT Efficiency and IT Standardization vs IT Differentiation.

To raise motivation amongst employees is an important factor behind OA within infrastructure. Hence, motivation invokes innovative usage of infrastructure that push the organization towards efficiency gains. Furthermore, the emergent possibilities with infrastructure as a service (IaaS) are key factors to slimline costs while having the option to implement new solutions. Balancing activities are limited in this domain, only two direct approaches were discovered.

#### **4.3.1. Blend**

By being transparent and concretizing costs, respondent D expresses common goals throughout the organization. Then, the employees become more concerned and motivated to aim for higher goals. By incrementally strive for efficiency gains, resources are released, resources which can be used to drive innovation.

*D: In many ways what i see, it's all about creating room for innovation by lowering cost or constantly work with continuous improvements. It is also about getting everyone in the organization with us, in my case, it's a lot about communication. I'm trying to explain cost, in what space we can work within and what we in IT what new cool stuff. We have to create room for trying and experimenting. It is no one else who creates it for us.*

Respondent A underlines the importance of constant innovation as a factor behind efficiency gains. By motivating employees to think outside the box, small, innovative, ideas are born that optimizes existing potential in the infrastructure.

*A: So this is why every decisions look exactly the same way, if you look at IT's part, it is extremely important with innovation constantly [...] Right now we have limited data storage and we hae not put it in the budget so then we created recycle bin day where the three business units that succeed with this and have the most data deleted from a certain date to another win a cake, it saves us a lot of money.*

Also respondent D motivates the co-workers to try new ideas to drive innovation. A budget is dedicated that employees are trusted to use on their own behalves. Furthermore, to ensure that products are ready to be used on a daily basis, communication and multidisciplinary involvement are factors to secure long term functionality of new products.

*D: And another thing we say is that you can try your way forward, as long as you keep our budget and within the limits. But before going into production, then you need to settle an agreement with operations and infrastructure so that the product is stable, supported and that is can be managed in cycles.*

Respondent B describes a situation where substantial investments in renewing infrastructure are already made, to earn the full potential of the infrastructure further investments are needed in terms of sourcing or educating users. Respondent A is in a similar situation, but in contrast to respondent B, resources are dedicated for further utilization of the infrastructure. Thus, the full potential of the investment can be reached while driving innovation on the existing infrastructure.

*B: What we are doing is that we educate ourselves in the frame of the infrastructure we have. I think we have much more potential than what we use today, but we do is that we educate, we develop skills, we have skill exchanges. We do a lot in that area.*

*A: We have remodelled our whole environment, we have a really modern Microsoft environment. We made a really big migration a few years ago that we constantly keep on expanding. We have money set aside in the budget each year to continuously change it. I would say that we are current there.*

Both respondent D and E harnesses the new possibilities of IaaS delivery models and cloud computing. Respondent D describes a structure where practically all hardware are outsourced which makes it possible to dynamically scale up and implement new solutions. The easiness of procuring for more capacity makes it important to educate employees regarding costs of infrastructure.

*D: Our infrastructure is growing, we've not achieved full virtualization yet, but at least 90% by now. We have outsourced all our storage, backup and hardware as a service so the possibilities are there. Then again, it cost money anyway because we don't have anything inhouse. That is the downside of open source products, they are easy to scale up so to speak, but after a while there will always be a compliance discussion because people believe open source is free which it is not. [...] Instead, if you don't buy capacity in the form av services then you will have more opportunities to be dynamic and make changes faster, but you would own your on infrastructure and become locked.*

Respondent E has achieved a situation where expenditure of infrastructure are slimed while being ready to swiftly scale up capacity as soon it is needed. Both respondent D and E has the ability to try out and implement innovation, and at the same time minimize cost.

*E: We are extremely efficient, we currently cost less than 1.8% of our total turnover which is which is not much at all if you compare with baseline, it could be up to 4-5%. We also have high utilization, but how it is in number i don't know. But i mean, we design to continually add and improve instead of making huge investments and then need two years to grow into it.*

*D: In IT terms, we have designed us in such a way that allows us to scale extremely efficient and modular, we can scale up in no time and it is not complicated to do so. Thus, we don't need to buy more capacity than we are using right now. We have high utilization without being afraid that we feel limited.*

#### **4.3.2. Balance**

Respondent A describes how infrastructure cannot be efficient and innovative simultaneously, overcapacity is necessary to prepare for change.

*A: There is an overcapacity, and it is clear that we would never be in a state of having zero storage left, it is clear that there must be some room there. It is proactive measures I would say.*

Respondent D underlines that balancing is constant between decisions to consider new, unfamiliar, infrastructure and utilize existing competence of employees. Respondent D employs a strategy where they buy infrastructure “off the shelf” instead of bespoke development, doing so, matching new services to their competence.

*D: We have a strategy for IT where we have several framework agreements. For example, we buy rather than develop ourselves, it is packaged services that are attractive. But solution is not as important as competence, if we have a lot of skilled Linux developers we want to reuse that competence instead of forcing them to learn new skills. Competence is the more expensive part of the equation.*

#### **4.4. Application needs**

This domain concern decisions that specify different business needs to generate value. All five paradoxes are present in this domain, but the most significant are IT program control vs IT project autonomy and IT program agility vs IT project stability. To achieve OA, the most noteworthy patterns are to re-use and develop technology in close relationship to the end users, resulting in more innovation for less money. Furthermore, the intention of an investment should be to satisfy a functional need, rather than aim for specific solutions, this ensures cost effectiveness. The CIOs struggles to achieve OA regarding which application needs to provide for; often the effects of an investment are difficult to evaluate on beforehand. Thus, they need to balance investments against the budget.



#### 4.4.1. Blend

In order to support innovation and also keeping cost down, respondent A ventures in using technology in somewhat atypical manners. By doing so, cheap technology can be utilized to deliver valuable results in unexpected areas. This inventive thinking raise the possibilities to identify and satisfy application needs throughout the organization.

*A: I have big faith in these innovative ideas as the recycle bin i spoke of earlier [...]. Within health care for example, there we use gps transmitters that hangs around the neck, for people with alzheimer's. Then, relatives can send a sms to a number and receive a location of where this person are. This cost 30 kronor, and are actually made for other purposes. It is about constantly find such innovative solutions to develop the organization, and we are good at it.*

In a similar fashion, respondent B describes that they seek to meet application needs by agile testing and small scale enrolment of new solutions. Customers get to try and feedback proposed applications in beforehand which improves the feasibility to discover application needs. As in respondent A:s case innovative applications are procured that often minimizes costs.

*B: Often, we work with pilots and testing. Make quick releases and so forth, then we don't build it in our robust architecture, instead we try outside and work in a lab environment, and test in a few shops [...] After we have adjusted to the customers feedback, we commit fully.*

Both respondent B and D use a blend approach to ensure that implementation of innovative applications can become as efficient as possible. In this way, they can be implement applications fast in the business while still remain efficient with resources.

Respondent B appoints two project leader roles, one from the IT side and one from the business side, B illustrate this as follows:

*B: [...] in our projects, we always have one project leader representing IT who is working with the technical solution. And one project leader representing the business who make sure implementation is ongoing which could be about maybe both changing a process, changing the organization, educate employees, breed motivation and so forth.*

D use another approach for the same purpose as B by assigning super-users:

*D: Then we try to work with ordinary, super users, to find some driving spirits who thinks this 20% of change is good, we try to find them, educate them a little extra [...] then they will be more motivated to convince their colleagues*

To blend innovation and efficiency, Respondent D enforce a policy where the business only can demand functionality not certain applications. Through this, organization can innovate through new applications and still enables the CIO to choose the most efficient solution for the application portfolio:

*D: One of devices are that no one gets to wish for application, instead, they can wish for functionality or if there is a need for something [...] we want areas for collaboration, or more automatisations, that is what to speak about.*

#### **4.4.2. Balance**

In this domain, some interviewed respondents perceive that they need to employ a balancing approach when managing business needs. Respondent C illustrate this by saying that it is difficult to communicate to the business how certain application needs will affect the organization. The CIO has to balance between cost and complexity on one side and critical IT deliverables on the other.

*C: [...] even though I try to explain this mundane question formulations, that it raises cost for administration and increase complexity when stepping aside from standard tools [...] the organization still thinks “that this is critical for business”, “this we must have for our development” and so forth.*

Respondent D support the view of respondent C by describing that application needs occur in the business, and it is the IT department's role to evaluate what type of applications and functionality IT can provide in relation to cost. Consequently, the CIO must balance between application needs and budget.

*D: Of course I must find a balance between that. If you that the requirements of IT always is with the business “how they like to work”, what type of support the need, what functionality the like. Of course i consider that they should have full freedom expressing this. Then it is my job to think of the total cost for all IT. There, our CEO has put all responsibility on me, meaning that I’m responsible for keeping the budget. Sometimes on at the expense of pleased internal customers.*

Another balancing strategy is employed by respondent E which describe that it is important to balance between knowing the source of the problem good enough, and when to begin implementing a solution for it. Starting implementation to early, narrow the possibilities of choosing between solutions.

*E: A very large problem from IT, and with IT I include all our R&D, is that when beginning so solve problems with technology to early, you get locked in dimensions before being wise enough to understand which problem to resolve. [...] technology should be defined as late as possibly in the process [...]. But we [IT] should be a part of the process as early as possible.*

## 4.5. Investments and Prioritization

This domain is concerned with making decisions about how much and where to invest in IT as well as project approval and justification techniques (Weill & Ross, 2004). Here, the paradox IT Innovation vs IT Efficiency is significantly dominant. The major pattern to blend is to enable innovation investments by first prioritizing efficiency. Plentiful options of new solutions requires balancing between keeping existing technology and implementing new to satisfy business needs.

### 4.5.1 Blend

When we analyzed our data, a pattern of blending emerged when CIOs prioritize investments. Respondent D stated that in order to obtain innovation and efficiency, one must first invest in efficiency gains to release capital to include investments in innovation as well:

*D: You have to work with constant improvements and cost reductions to release money for innovation.*

Like respondent D, the following quote indicate the same approach:

*B: We have worked immensely with the cost of IT in what i call IT production to reach effectivity in IT production. We have really succeeded doing this, and released money for the experimental part.*

Respondent D underlines the importance of a close relationship towards the business, this makes it easier to justify both investments for innovation and innovation:

*D: And this is a discussion of course with the business, to get them to understand why i take these decisions and why we do stuff. So it is all about communication, so that I'm not regarded as a dictator, because that is appreciated by no one.*

Also respondent B embrace a close relationship between roles to make the most of investment and prioritization ideas that surface across the organization.

*B: [...] our business architect works in close relations with the business. And sometimes ideas comes from all different directions, so sometimes it is us that drives [innovation], and sometimes it is the business, but we always work in close relation with the business with that [innovation].*

### 4.5.2. Balance

Respondent A find that it can be challenging to satisfy requests from end users of IT within the organization while also maintain and keep core infrastructure up to date. This requires balancing or prioritization between the two.

*A: To us customers are the most important, meaning that we are very cautious about them presenting the ideas which are executed. Sometimes this can be a tricky balance, there can be many seeking attention simultaneously, while also central investments in servers and storage needs handling. So it is a tough balance to make. There, it is about prioritizations, and it is my task at the end, to prioritize [...]*

Respondent D recognizes the same issue as respondent A when choosing between potential investments. The solution is to keep a continuous dialogue with the organization and find support from the board of directors to achieve a proper balance. Furthermore, respondent A find it especially hard to keep up with the ever increasing possibilities of digitalization and to invest at the right time.

*D: Continuous dialog simply put, that's what it is about. Trying to balance and measure against each other, we are having that discussion right now, I have forced my colleagues in the management team to rank projects and major initiatives in terms of governance, what is most important?*

*A: We can not afford to invest right now but we can plan it in next year's budget and see if we can get expanded funds for this then. There is always a balance, the problem is that everything is going very fast right now, digitalization in a very high tempo.*

A substantial bulk of fixed costs undermines the possibility of driving innovation while achieving efficiency gains, in such situation respondent D sets aside a part of the budget that can be used for innovation. The same goes for respondent A which has about 15% of the budget set aside for more spontaneous projects.

*D: [...] in an organization as ours a substantial part of cost is fixed [...] it is important to make this visible and to know that here, we can strive for constant improvement and continuous cost reductions. Then we have a portfolio of about X MSEK for innovation, which is about 10 % of the total budget we have set aside for this.*

*Interviewer (I): Is it difficult to find a balance between innovation and efficiency like that?*

*A: Yes it is, very difficult, I agree.*

*I: Is there any part of the budget that can be used for fast decisions?*

*A: Yes I've made that happen.*

*I: Is this a part of the official budget?*

*A: No.*

*I: What proportion of the budget if I may ask?*

*A: X million SEK*

*I: Ok, what percentage is this of the main budget roughly?*

*A: This year we have X million SEK, it is quite a large portion [≈15%].*

## 5. Discussion

The purpose of this thesis was to investigate how CIOs balance and blend innovation and efficiency through IT governance. To get a structured view of which tasks a CIO face in their line of work, we have used Weill and Ross (2004) view on IT governance that constitute of five different decision domains. Moreover, we found it important to have a clear perspective of what role the CIO adopt while executing their tasks. Therefore, we used another part of the work from Weill and Ross (2004) which defines IT governance as delegating decision rights throughout the organization. By using the paradoxes with OA in an IT context identified by Gregory et al. (2015), we had a concrete basis of paradoxes to focus on during our interviews with CIOs. This gave us good insights in how the CIOs worked within each domain. Cao et al's., (2009) separation of balanced OA and combined OA are used in our empirical findings for further explanation and structuring.

To deepen the understanding of how the CIOs strive to reach OA by balancing and blending in the discussion of this thesis, we will use the work of Gibson and Birkinshaw (2004), which separates structural and contextual OA. Since contextual OA is a complex than structural (Gibson and Birkinshaw 2004), we will use the work by Ghoshal and Bartlett (1994) explaining the mechanisms behind organizational contexts.

In this chapter, we systematically discuss our findings in relation to theory and research question. First, we discuss blend strategies, which are separated in contextual and structural OA. Second, we discuss balance strategies. This structure enable a focused discussion to follow the patterns in a straightforward manner.

### 5.1. How blended organizational ambidexterity is accomplished

Throughout our empirical findings, clear signs of blended OA revealed themselves in all of the five domains of IT governance. We interpret this as a strong implication that our method of combining Weill and Ross (2004) framework with Gregory et al's., (2015) paradoxes was suitable to answer our research question. However, there was some differences between the domains in terms of frequency of blend activities when comparing our results. Since the paradoxes that prevents CIOs from achieving OA differs dependent on the context (Gregory et al., 2015), it is also innate that the domains are more or less manageable with a blend approach.

#### 5.1.1. Contextual organizational ambidexterity

Contextual OA, which is the softer approach suggested by Gibson and Birkinshaw (2004), are explained by identifying the four aspects: discipline, stretch, trust and support (Ghoshal & Bartlett, 1994). The most elementary factor behind building a context which supports a certain behavior should be to establish a shared set of common goals (ibid). Therefore, it is not surprising that this is the most prominent factor within IT principles since common goals also is

fundamental for IT governance (Weill & Ross, 2004). Deriving from this, establishing common goals requires a bit of education throughout the organization to ensure that employees can grasp the bigger picture. Several of our respondents emphasizes the importance of educating their employees, not only impose a shared vision, but also in order to be able to delegate decisions. By doing so, decision making will be more effective while also including more ideas since more voices will be heard.

This disciplined approach with education of employees also opens up for improved trust amongst co-workers (Ghoshal & Bartlett, 1994). Intraorganizational communication between or within groups in an organization can sometimes be challenging. Education of each other's needs is only one part of the path towards trust, the other is for the CIO to work as an intermediary between roles. This solution is especially shown within IT architecture –not surprising since it is a high level decision domain. Thus, requiring multiple perspectives and good knowledge about the business (Weill & Ross, 2004). Furthermore, when procuring for new infrastructure, good knowledge about cost is a key factor behind being trusted with a budget and making smart efficient decisions.

More positive effects deriving from educating employees, are that with an understanding of one's position towards long term organizational goals the personal commitment will raise significantly (Ghoshal & Bartlett, 1994). A majority of our respondents expresses that with more motivated employees, the frequency of innovation will not only increase, people also tend to think more outside the box and set higher goals. These clear examples of stretch (Ghoshal & Bartlett, 1994) is not only good for innovation itself, but also a common factor behind smart, incremental, innovative ideas that reduce cost and improves efficiency throughout the organization.

### **5.1.2. Structural organizational ambidexterity**

As with contextual OA, patterns for structural OA revealed themselves throughout all domains in our empirical findings (Gibson & Birkinshaw, 2004). Again, implicating that our method is suitable for identifying blended OA activities. Interestingly, bi-modal IT (Mesaglio & Mingay, 2014) are the first of two major patterns we identified as structural OA. Within the two most high level decision domains IT principles and IT architecture, separation is the main solution towards OA. To make this separation on a high level affects the line of work throughout the rest of the domains (Weill & Ross, 2004). One expressed downside of the separation is that a “silo mentality” could emerge, meaning that information is trapped within single systems, or small groups. Thus, a risk of suboptimization is prevalent and the possibilities of synergy effects are diminishing.

With the risk of a silo mentality in mind, it is reasonable that in many of the domains, different techniques for improving communications are found. An example of such technique is the creation of intraorganizational communication, leading to procurement and development of infrastructure that are more likely to fit the organization's long term needs. Another example is

the use of multiple project leaders within a single project when identifying and satisficing the organization's need of applications. By using more than one project leader, several perspectives are used to fulfill multiple goals. Another strategy used within application needs for bridging the gap between the bi-modal IT tracks, is to use agile testing and small scale enrolment of new solutions throughout the organization.

The next major pattern for structural OA is to use innovation with the goal of achieving efficiency gains and consequently releases resources to drive further innovation. This was approach were used by a majority of our respondents. Another common approach to make more use of existing resources in organizations which already had made substantial investments in new infrastructure (e.g. ERP systems), was to dedicate resources within budgets to explore the existing possibilities; often only parts of ERP systems were exploited. Finally, to streamline costs while also making room for innovation within infrastructure, the usage of infrastructure as a service delivery models opened up totally new possibilities for the organizations. CIOs who already implemented IaaS, showed clear signs of structural OA because of this.

## **5.2. How balanced organizational ambidexterity is accomplished**

Cases where acts of balanced OA are found means that the organization has not been able to support innovation and efficiency, without making trade offs between the two (Cao et al, 2009). Instead, the CIO has identified a balance that is suitable to their organizational needs (ibid). As with examples of blended OA, balance are also found throughout our result. However, there are significantly less instances of balanced OA. Whether this means that our method is unsuitable for finding balanced OA, or that the CIOs in our sample are profoundly good at achieving blended OA remains to be answered. More interestingly, many cases of balanced OA resolves situations where in other cases blended OA are used. Hence, the same type of paradox can often be resolved with both a blend and balance strategy. We interpret this as an implication that there are OA solutions to most paradoxes in the IT context, solutions where also blended OA can be achieved. Perhaps the solutions for OA are more or less viable, depending on what type of organization that is studied. Following this, it is intuitive that our diversified sample displays such an ambivalent result with balanced and blended OA overlapping each other.

The lowest common denominator appearing as a factor behind balanced OA are cases where restricted resources prevents CIOs from making the investments required. In those cases, prioritizations must be made between innovation and efficiency. When comparing the answers of the CIOs that constitutes our sample, it was clear that those with more restrictions of how to use resources more often showed signs of balanced OA. This goes well hand in hand with the findings of Cao et al's. (2009) study, which present evidence that blended OA is more prominent in wealthy organizations. Following Smith et al's. (2016) thoughts on the distribution of resources, to spend more often lead to generative effects, thus resources will be saved in the long term. Leaders embracing this line of thinking demonstrate blended OA more often (ibid), our result show several instances of this.

There are several examples of balanced OA as a result of an absence of communication and shared visions. CIO's find it especially demanding to satisfy operational needs of applications since the effects of an application are difficult to evaluate beforehand. Also, the rapid pace of innovation makes it hard to follow the current market and keep the IT department up to date. In cases like these, the CIO strive to find a balance between the demands from business units and the IT budget; the CIO acts as a man in the middle, trying to find support from both the organization and the board. Following on previous chapters with examples of blended OA, we know that situations like these are resolved with improved communications and education of employees (Ghoshal & Bartlett, 1994; Gibson & Birkinshaw, 2004). Another case of balanced OA is when insufficient education leads to that the existing knowledge restrain CIOs to either invest in the most innovative or efficient technologies.



## **6. Conclusions**

In this study we set out to answer how CIOs balance and blend innovation and efficiency through IT Governance. Our result shows that a blended approach for OA are the true state of maintaining exploration and innovation simultaneously, and therefore being ambidextrous (Tushman & O'Reilly, 1996; Cao et al., 2009; Smith et al., 2016). Moreover, Gregory et al. (2014; 2015) claims that in situations where blending can not be achieved, balanced OA is to prefer. However, the findings of this study clearly shows that in most cases there are a blend solution to the given paradoxes, often through some sort of contextual OA (Gibson & Birkinshaw, 2004). The key activity to achieve blended OA is education of employees; our discussion shows that education enhances motivation, efficiency focus, fosters innovation and perhaps most important: drastically improves the possibilities of delegating decisions and thus engage more brains.

### **6.1. Implications for practice and research**

In this study we make several contributions for practice and research. First, these findings extend prior literature by showing, for the first time, how paradoxes (Gregory et al. 2015) can be resolved to achieve OA in an IT context. Second, by combining IT governance theory with OA theory, we contribute to an understanding of how IT governance domains and paradoxes affects each other. Third, our study provides concrete examples of how to achieve OA for an CIO, hence it is complementary to Mithas and Rust's (2016) more conceptual contribution.

### **6.2. Limitations and future research**

A limitation in our study is that we can not draw any conclusions for separate industries since our sample constitutes of multiple industries. Furthermore, this could be an explanation why solutions are overlapping each other. We suggest future research within one industry to examine if OA solutions are bound to suit a special type of context. To validate the theories deriving from this study, we suggest a longitudinal study which focuses on the effects of education amongst employees to the possibilities of delegating decisions and thereby achieve OA. Another limitation is that only focusing on interviews have limited us not to use triangulation to measure accuracy of this study. If a similar study would be done in the future with a more generous timeframe, more data collection methods such as policy document analysis and observation of decision situations could be conducted.

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