



Turun yliopisto  
University of Turku

# ESSAYS ON THE TASKS AND THE ROLE OF CHIEF INFORMATION OFFICERS

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Päivi Hokkanen



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## **Abstract**

The purpose of this research is to describe the constantly changing role of a CIO. IT is one of the youngest functions found in organisations; it started to develop in the 1950s, gradually becoming established in the 1960s. By the end of the 1970s, it was still a support function in all industries (Ross & Feeny 2001). Now, about 50 years later, there are industries in which information technology (IT) and business can no longer be separated, and to pose the question of how to align the IT strategy with the business strategy (Henderson & Venkatraman 1989) is outdated, because IT is the core of the business strategy. One example is the finance company Goldman Sachs, in which 10 000 of 33 000 employees are engineers and programmers (Gupta 2016).

Consequently, IT organisations have spent their entire existence in the midst of change (Hirschheim, Porra & Parks 2003). It can be said that there is no single established way to gain the most value from IT. There are several categorizations of the profile of the IT function. In many cases, IT is still seen as a support function and its role as delivering computing power to business organisations. In these cases, the IT investment decisions are made not by the IT department but by the business management, which holds the responsibility for these investments (Guillemette & Pare 2012). However, the IT organisation has the potential both to create effectiveness and to add customer value. Furthermore, IT is able to act as the function that creates a cash flow through technological innovation and, by transforming the enterprise, to incorporate new business (Polansky, Inuganti & Wiggins 2004).

Clearly, if IT organisations have been in turmoil, so has the role of a CIO. During several decades, numerous studies have been conducted on the role of a CIO (e.g. Synnott & Gruber 1981, 45-69; Applegate & Elam 1992; Ross & Feeny 2001; Fisher 2003; Chun & Mooney 2009; Weill & Woerner 2013), and researchers have reached the consensus that the role is changing. However, it seems that the shared understanding of the role has not stabilised yet. This research explores the reasons for the changing role of a CIO and its value to companies. It concentrates on the main factors influencing that role.

This interpretive work offers several theoretical contributions. The results demonstrate that the Leavitt model (Leavitt 1965, 1145) endures over time and describes the factors that exert an impact on the role and tasks of a CIO in an organisation. The findings also show the usefulness of the punctuated equilibrium model combined with Granovetter's (1973; 1983; 2005) social network theory adopted from organisational research. The enhanced interactive multi-stage interview method is another contribution. It was developed for and used in this research. The findings indicate that the method enhanced the credibility and trustworthiness of this interpretive study.

The main contribution to the communities of practising CIOs is a profound understanding of the role and the tasks of a CIO in an organisation. Due to the increasing role of information technology, executives need to find new ways to organise the division of IT work in an organisation. That is, the traditional way of organising IT work into an isolated IT function may no longer work. Freeing the CIO from the IT silo enables the organisation to enhance its efficiency and find optimal solutions to lead and deploy the technological (r)evolution in business. According to our interviewees' perceptions about their own role, organisations appear to have different views about the CIO's role and tasks. A graphical tool was created to show imbalances in work equilibria, and the resulting graphical presentations were shown to be powerful tools to create a shared understanding of the issues hindering cooperation in an organisation.

**Keywords:** CIO's tasks and role, organisational change, IT function, business strategy, IT strategy, enhanced interactive multi-stage interview method.

## Tiivistelmä

Tämän väitöstyön tarkoituksena on tutkia tietohallintojohtajan alati muuttuvaa roolia organisaatioissa. Tietohallinto on yksi uusimmista toiminnoista organisaatioissa; se alkoi kehittyä 1950-luvulla vakiintuen vähitellen 1960-luvulla omaksi erilliseksi toiminnokseen. Edelleen 1970-luvun lopulla se nähtiin tukitoimintona kaikilla toimialoilla (Ross & Feeny 2001). Nyt, noin 50 vuotta myöhemmin, tietyillä toimialoilla informaatioteknologiaa (IT) ja liiketoimintaa ei voi enää erottaa toisistaan. Näillä toimialoilla liiketoimintastrategiasta erillistä IT-strategiaa (Henderson & Venkatraman 1989) ei enää tehdä, koska IT on liiketoimintastrategian ytimessä. Yhtenä esimerkkinä tästä on finanssisektorilla toimiva Goldman Sachs, jossa 33000:sta työntekijästä 10000 on insinöörejä ja ohjelmoijia (Gupta 2016).

Näin ollen IT-organisaatiot ovat olleet koko olemassaolonsa ajan muutoksessa (Hirschheim, Porra & Parks 2003). Edelleenkin ei ole yhtä vakiintunutta tapaa saada IT:stä parasta arvontuottoa, vaan IT-organisaatioille on yhä useita erilaisia profiileja. Usein IT-organisaatio nähdään edelleen tukifunktiona, jonka rooli on tuottaa laskentatehoa yritykselle. Tällöin IT-investoinnit päätetään liiketoimintajohdon eikä IT-johdon toimesta ja liiketoiminta kantaa myös vastuun näistä investoinneista (Guillemette & Pare 2012). Toisaalta IT-organisaation voidaan nähdä paitsi luovan tehokkuutta myös lisäävän asiakasarvoa. Tämän lisäksi se voi teknologisten innovaatioiden avulla kasvattaa kassavirtaa ja toteuttaa yrityksen transformaation uuteen liiketoimintaan (Polansky, Inuganti & Wiggins 2004).

Samoin kuin IT-organisaatiot myös tietohallintojohtajan rooli on ollut jatkuvassa myllerryksessä. Tästä roolista on tehty lukuisia tutkimuksia useiden vuosikymmenten aikana (kuten Synnott & Gruber 1981, 45-69; Applegate & Elam 1992; Ross & Feeny 2001; Fisher, 2003; Chun & Mooney 2009; Weill & Woerner 2013) ja tutkijat ovat yksimielisiä siitä, että rooli muuttuu. Näyttää kuitenkin siltä, että yhteistä käsitystä ei ole syntynyt siitä, mikä roolin pitäisi olla. Tämä tutkimus etsii syitä tietohallintojohtajan muuttuvalle roolille ja roolin arvosta yrityksille. Tutkimus keskittyy tekijöihin, jotka vaikuttavat tähän rooliin.

Tämä tulkinnallinen tutkimus tuottaa useita teoreettisia kontribuutioita. Ensinnäkin tulokset osoittavat, että Leavittin malli (Leavitt 1965, 1145) kestää edelleen aikaa, ja se kuvaa ne tekijät, jotka vaikuttavat tietohallintojohtajan rooliin ja tehtäviin organisaatioissa. Tutkimus osoittaa myös, että Granovetterin (1973; 1983; 2005) sosiaalinen verkostoteoria yhdistettynä evoluutiomalliin (punctuated equilibrium) selittää hyvin saatuja tuloksia tässä organisaatiotutkimuksessa. Kolmanneksi, tässä tutkimuksessa luotu parannettu interaktiivinen monivaiheinen haastattelumetodi on uusi tieteellinen kontribuutio. Metodi on kehitetty ja sitä on käytetty tässä työssä. Tulokset osoittavat, että se lisää tulkinnallisen tutkimuksen uskottavuutta ja luotettavuutta.

Merkittävin tulos yritysjohdolle on perusteellinen käsitys tietohallintojohtajan roolista ja tehtävistä organisaatioissa. Informaatioteknologian merkityksen kasvun myötä yritysjohton on löydettävä uusia tapoja organisoida IT-työtä. Perinteinen tapa eristää IT-työ erilliseen IT-organisaatioon ei välttämättä enää toimi. Vapauttamalla tietohallintojohtaja IT-siilosta mahdollistaa tehokkuuden lisäämisen organisaatioissa sekä parantaa teknologisen (r)evoluution johtamista ja tuottamista liiketoiminnassa. Haastattelujemme perusteella organisaatioissa näyttää olevan erilaisia käsityksiä tietohallintojohtajan työstä ja tehtävistä. Loimme tutkimuksen aikana graafisen tasapainomallin havainnollistamaan epäsuhtia työn tasapainossa. Tulokset osoittavat, että näiden mallien avulla kyettiin luomaan yhteinen ymmärrys syistä, jotka estävät yhteistyötä organisaatioissa.

**Avainsanat:** Tietohallintojohtajan tehtävät ja rooli, organisaatiomuutos, IT-organisaatio, liiketoimintastrategia, IT-strategia, parannettu interaktiivinen monivaiheinen haastattelumetodi.

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Most of the articles are written together with Professor Tomi Dahlberg and Professor Mike Newman. At the beginning of the research Ph.D. Harri Hyvönen participated also as a member in our research group. He collected part of the data and participated in writing one of the articles. The cooperation with this research group was very productive, and we held several enjoyable negotiations about the collected data, the analysis of the results and planning the next steps.

Without the support of my colleagues, the acting IT leaders and decision makers in Finnish companies, this work would never have been completed. I want to express my gratitude to everyone who took part in my work and accepted the invitation to be interviewed. It is impossible to name all of them here, because this group contained more than 40 people. However, I want to thank specifically Mrs. Maarit Laakkonen, among others, for her invaluable support. I am also grateful to you who encouraged me along my journey. My dear workmates and colleagues; Hellevi, Kaisu, Merja, Tuula, Ulla, Ilkka, Pekka, Ida, Sven, and Kari to name but a few, you are in my pleasant thoughts.

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Tiivistelmä

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- Article 2.** Dahlberg, T. - Hokkanen, P. - Newman, M. (2016b). “How Business Strategy and Technology Impact the Role and the Tasks of CIOs: An Evolutionary Model.” *International Journal of IT/Business Alignment and Governance*, Vol. 7 (1), 1-19.
- Article 3.** Dahlberg, T. - Hokkanen, P. - Newman, M. - Hyvönen, H. (2017a). “Understanding the Changes in the Role and the Tasks of CIOs: An Evolutionary Boundary Model.” *IAC online journal*, Vol. 1 (1), 6-26.
- Article 4.** Dahlberg, T. - Hokkanen, P. - Newman, M. (2017b). “A Longitudinal Study on the Perceived Roles of IT and the Corporate IT Function with Influences on CIOs’ Work Equilibria in a Media Company.” In: *Proceedings of the 50th Hawaii International Conference on System Sciences*, 5164-5173.
- Article 5.** Dahlberg, T. - Hokkanen, P. - Newman, M. (2017c). “A Socio Technical Punctuated Equilibrium Model Enhanced with Social Network Theory: As the Descriptor of Changes in the Equilibria of CIO Work.” *International Journal of IT/Business Alignment and Governance*, Vol. 8 (1), 1-16.

# 1 INTRODUCTION

## 1.1 My own background

This work concentrates on the tasks and role of the chief information officer (CIO) in an organisation. The genesis of this work lies in my own work history. I have been working in information technology (IT) organisations since 1979 and have held a number of IT roles during these decades. I started to work in IT as a programmer and went on to hold positions like project manager, quality manager, account manager and IT leader with more than 100 employees. Since January 2002, I have been acting as a CIO. The first 7 years were spent as a group CIO in the retail industry, followed by 4 years in the media industry and afterwards 5 years in the automotive industry. I have been engaged in several CIO communities, such as Gartner's CIO Leadership Forum and ICT Leaders Finland, over these years. Therefore, I have been an eyewitness to the development of the CIO's changing position and the progression of IT in enterprises. I have been looking at the IT field from different viewpoints for more than 35 years, having been a technician, an auditor, a solution provider and the head of several group IT functions. This study has emerged from the need to understand the role of CIOs and produce research that is relevant to practitioners (Klein & Rowe 2008, 676).

Having this strong background in the field, I cannot position myself as a neutral researcher. I understand that my research is shaped by my own history, gender, social class and organisational status and by the people in the research setting, such as my research colleagues, CIO colleagues and interviewees. Because of my CIO role in retail, media and automotive organisations, as an active leader, I consider myself to be a reflective practitioner trying to understand the world with a strong preunderstanding of the problem realm. The practice of reflection is an activity involving the contemplation of the actions of oneself and others in the immediate environment from time to time (Schön 1991, 62-63; Heiskanen & Assinen 2003, 184). In other words, the purpose is constantly to deepen one's understanding as an outcome of reflection.

*It is a conscious experiencing of the self as both inquirer and respondent,  
[...] as the one coming to know the self within the process of research  
(Guba & Lincoln 2005, 210).*



Heiskanen (1995, 6) described Schön's approach, in which the practitioners are involved in situations that demand action and value conflicts in relation to such action. Furthermore, they have personal relationships that affect the situations. To gain a deeper understanding of the issue, practitioners use reflection in action by critically examining their own methods and approach. Moreover, they try to develop a practice-oriented theory with which they can explain the situation and decide how to continue.

The CIO role emerged decades ago, described by Synnott and Gruber (1981, 66) as follows:

### *CIO*

*Senior executive responsible for establishing corporate information policy, standards, and management control over all corporate information resources.*

Nevertheless, research on what CIOs do or should do (e.g. Brown 1993; Penrod 2003) has been conducted ever since. Questions concerning the kind of professional and personal qualities that they should have (e.g. Rockart, Ball & Bullen 1982; Applegate & Elam 1992; Smaltz, Sambamurthy & Agarwal 2006) have attracted the interest of researchers. Furthermore, studies investigating whether CIOs belong to the executive managers or not, whom CIOs report to or should report to (e.g. Applegate & Elam 1992; Fisher 2003; Banker, Hu, Pavlou & Luftman 2011) and how they spend their time (e.g. Couger & Amoroso 1989; Weill & Woerner 2013) have been widely performed. (cf. Dahlberg, Hokkanen & Newman 2017a.) The most recent research has also posed questions regarding who should lead a company's digital transformation and whether CIOs' work should be split into several roles, like CDO or CTO (Haffke, Kalgovas & Benlian 2017).

However, a consensus on these matters has not been reached. What we know is that the way in which the organisational roles of CIOs are understood and defined within enterprises has an impact on what they do (Brown & Ross 1999; Henderson & Venkatraman 1999; Ross & Feeny 2001; Chatterjee, Richardson & Zmud 2001; Agarwal & Sambamurthy 2002; Hirschheim et al. 2003; Byrnes 2005; Peppard 2010). Scott's (2003, 19) definition of a role is that it is an expectation for or evaluative standard used in assessing the behaviour of the role holder for a specific position. In this research, a role is defined as the organisational status and influential possibilities within an organisation (Dahlberg, Hokkanen & Newman 2016a; 2016b; 2017a). Tasks are referred to as work content, that is, what a CIO actually does in her/his profession (Dahlberg et al. 2016a; 2016b; 2017a). During the past five decades, the deployment of IT within enterprises has grown from internal business support and efficiency targets to external value creation and revenue recognition, such as automated

customer self-service. Consequently, the significance of IT for enterprise activities has also grown in importance as more and more of those activities have become IT dependent (e.g. Gottschalk & Taylor 2000; Fischer 2003; Polansky et al. 2004). While recognizing the ever-growing impact of technology on enterprises, who should lead IT is not a trivial question. That is also the starting point of this work.

Considering my own experiences as a CIO and the empirical evidence that we have collected, it appears that the growing importance of IT is self-evident in all large-sized enterprises. We did not find any industry-based differences in CIOs' work in our own data (Dahlberg et al. 2016a; 2016b; 2017a), which mainly refer to large-sized enterprises in Finland.<sup>1</sup> However, there are small and medium-sized enterprises (SME)<sup>2</sup> that have no internal IT skills and use only a few IT services, which they buy from suppliers. According to the UK's Department for Business Innovation & Skills (2015), the largest barriers to the use of digital technology in SMEs are the low priority of IT in business, the lack of time, the cost of using external suppliers or employing an expert and the lack of knowledge. The report did not state whether the lack of IT use is also a barrier to business growth. Therefore, it seems that the company size and the complexity as a consequence of the size are important factors in the discourse on CIOs' role and tasks.

This research examines the rapidly evolving tasks and role of a CIO in an organisation and the justification for them. Our research group's preliminary understanding of the subject and my own experience concerning the CIO's work guide this research. It is accomplished with scholarly papers and two sets of empirical material. The first set of empirical data consists of interviews with Finnish IT leaders. The second data set deals with a case study concerning a CIO's role in a media company and involves two CIOs from the first data set. They worked in companies that merged after the first data set was finished. In this case study, the business interruption's impact on the CIO's work equilibrium is researched.

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<sup>1</sup> The CIO profiles, date interviewed, experience, gender, age group and company size are presented in Appendix 1.

<sup>2</sup> "The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro" (extract from Article 2 of the Annex of Recommendation 2003/361/EC).

## 1.2 The structure of this research

The structure of this thesis is presented in Table 1. In the introduction, I briefly described my own background and the reflective methodology used in this work. The need for understanding CIOs' work was also described. The second chapter explains the researcher's motivation, starting with the management paradigms in organisational studies and then concentrating on the IT function and its tasks in general. In addition, the research questions are presented. In the third chapter, the philosophy and methodology describing the basic assumptions of the author in carrying out this research are presented. The longitudinal approach and the quality criteria for it are provided. Furthermore, the theoretical frameworks used in the research and the data collected are depicted. The interview method and the way in which it was enhanced during the work as well as the methods for analysing the data are also described. In chapter four, the selected articles, their research objectives and their findings are introduced. Chapter five reports the findings of this research. The answers to the research questions are presented using the theoretical frameworks of the research. Chapter six concludes the work. The theoretical and practical contributions are presented, and the research limitations and suggestions for further research are discussed.

Table 1. The structure of the thesis

|   |  |
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| 2.  | How Business Strategy and Technology Impact the Role and the Tasks of CIOs: An Evolutionary Model  |
| 3.  | Understanding the Changes in the Role and the Tasks of CIOs: An Evolutionary Boundary Model  |
| 4.  | A Longitudinal Study on the Perceived Roles of IT and the Corporate IT Function with Influences on CIOs' Work Equilibria in a Media Company    |
| 5.  | A Socio Technical Punctuated Equilibrium Model Enhanced with Social Network Theory: As the Descriptor of Changes in the Equilibria of CIO Work |
| Chapter 5. Findings                                   |  |
| Chapter 6. Discussion and Conclusions                 |  |

## 2 MOTIVATION AND EARLIER RESEARCH

### 2.1 Management paradigms in organisations

This research studies the IT function and specifically the CIO's role in an organisation. Ideally, the CIO is the leading professional for the development of digital systems and digital data and promotes change in an organisation. Digital systems are necessary parts of business processes, and their importance is increased by the use of automation, for example finance processes using robotics (e.g. KPMG 2016). The impacts on this IT-driven work may change all the organisational factors, such as structures, work roles, tasks and the use of technology. Therefore, to understand the management paradigms, it is necessary to create the frame of the domain investigated.

A paradigm is a general point of view or a way of thinking that reflects the foundational beliefs and assumptions of the actor or the subject, such as social theorists (Burrell & Morgan 1979, 23), scientists (Kuhn 1996, 43), researchers (Gummesson 2000, 208; Jonker & Pennink 2010, 23) or consultants (Gummesson 2000, 208), about the nature of organisations (Gioia & Pitre 1990, 585). Paradigms may be viewed as a set of basic beliefs that defines the nature of the "world" to its holder. These beliefs must be accepted like a faith statement, because there is no way to guarantee their truthfulness. (Guba & Lincoln 1994, 107.)

According to Guillén (1994, 7), management paradigms are a combination of interrelated ideas and techniques offering both a diagnosis for and a solution to a set of problems. These management paradigms steer the way in which personnel and organisations are managed. Guillén continued by stating that management paradigms present an ideological view of organisations, personnel and the hierarchical system of an enterprise (Guillén 1994, 8). These ideological views often include the undoubted belief in the certainty and generality of the governing wisdom about managing and organising. The unspoken presumption is that a stable equilibrium behaves in a predictable manner in its environment and success flows from identifying the disturbances, reacting to changes quickly and aligning an organisation with them. (Stacey 1996, 5.)

The commonly agreed central goals in a private enterprise are growth and profitability (cf. Hämäläinen 2010, 212), which are driven by created efficiency and functionality. Seck (2008, 29) remarked that all management paradigms attempt to increase efficiency in one way or another from the managerial point of

view. Certain activities may be useful for some members (for example shareholders) but not necessarily for others (for example workers) (Merton 1968, according to Grieves 2000, 24). Achieving the goals is more difficult in large and complex organisational environments filled with cross-functional power structures, such as matrix organisations. The IT function, together with HR and finance, is often organised as a matrix organisation for business units in organisational structures. While the CIO's work covers the organisational processes across business units, the business unit leaders may experience a certain degree of discomfort in this regard (Ross & Feeny 2001, 1; Peppard 2010, 91-93). The power structures are affected, and the responsibilities are less clear than before. Consequently, contradictory expectations may arise among business leaders regarding the tasks of the CIO. The impacts of the complex organisational structures and contradictory expectations are studied in greater depth in our case study articles concerning the perceived roles of IT and the corporate IT function (Dahlberg, Hokkanen & Newman 2017b; 2017c).

The chosen way to structure an organisation's work has a big influence on its efficiency (Scott Morton 1995, 22), and the way in which the work is understood defines the way in which it is managed (Seeck 2008, 39). As a logical implication, if the work is not understood, it is not managed properly or organised well. Thus, each management paradigm has attempted to face the current challenges. For example, F. W. Taylor's (1856-1915) scientific business management at the beginning of the twentieth century endeavoured to increase efficiency by dividing work in a new way, changing the structures and using new technology. It was a serious attempt to rationalize the performance of work (see, for example, Burrell & Morgan 1979, 127). Even though Taylor's concept of man in scientific business management was a simplified view of a human being and his/her intentions, his management paradigm was used successfully for several decades.

The creators of the contingency theory of organisation in 1967 were Lawrence and Lorsch, who studied several organisations in different market and economic conditions and could not find any one best way to organise a company (Burrell & Morgan 1979, 164-165). Joan Woodward conducted one of the earliest (1958, 1965) studies suggesting that technology and production systems played a crucial role in shaping effective organisational structures in industrial organisations (Dawson & Wedderburn 1980, xiii). She emphasised that commercially successful companies must design their structures to fit the situational demands, meaning especially the technology and technical methods used in the organisation (see, for example, Burrell & Morgan 1979, 161; Dawson & Wedderburn 1980, xviii). She also demonstrated in her research that small technical changes resulted in minor changes to the organisation, but a technical change in the production system caused fundamental organisational change

(Woodward 1980, 72). Our work is influenced by contingency theory in the following way: there are known factors beyond the control of CIOs that influence their work and role, affecting their work immensely and requiring them to adapt. For us, Leavitt's model (Leavitt 1965, 1145) constitutes those factors to which CIOs need to adapt.

The managerially oriented functional theories discussed above suggest that an organisation fulfils certain tasks and that, to be successful and efficient, the enterprise has to be organised in alignment with these tasks. Similarly, any part of the organisation, such as the IT function, should focus on the most important current tasks of the organisation. These tasks evolve over time and according to the business needs. Simultaneously, the IT function has to take care of all its legacy tasks, such as the maintenance of the applications and infrastructure. These two sets of tasks occasionally lead to contradictory expectations that require structural flexibility from the IT function and behavioural flexibility from its representatives.

The paradox is that the work of the IT function basically strives for change in an organisation, and this is not openly discussed within the organisation. Each new technology, application or change/integration of existing technology/applications changes or wipes out somebody's work in the organisation. These changes may also affect the existing power structures; thus, the inertia associated with any change in structure slows down this development. This was also experienced in our case study.<sup>3</sup>

## **2.2 The IT function compared with the other functions in a company**

The initial purpose of IT in organisations was no doubt to increase efficiency from the managerial point of view (see, for example, Synnott & Gruber 1981, 5; Ross & Feeny 2001). The first commercial computers in the early 1960s were used to increase the power of number crunching in finance departments. This purpose also defined the role and tasks of an IT organisation and its leaders at the time. One of the interviewees from our first data set claimed that, during the 1960s, IT organisations had to learn how to use computers from their own mistakes, because no formal training existed.

Between the mid-1980s and the mid-1990s, IT's ability to increase the productivity of an organisation was questioned. According to Loukis, Sapounas and Aivalis (2008, 24), there was little empirical evidence of a positive relation between IT investment and business performance. These results led to criticism

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<sup>3</sup> Articles 4 and 5 in this thesis.

of the practical usefulness and productivity of IT investments, which was collectively named the IT productivity paradox (see, for example, King 2011, 134; Hirschheim & Klein 2012, 209; Coltman, Tallon, Sharma & Queiroz 2015, 93; Sabherwal & Jeyaraj 2015, 810). Despite the existence of other studies that obtained opposite results (like Strassman 1984, 344; Benjamin & Scott Morton 1986, 1-5; Scott Morton 1991, 9; Brynjolfsson & Hitt 1996, 541), the role of a CIO was questioned as well (Earl & Feeny 1994). As of 2005, there were discussions concerning the actual survival of the CIO profession, the very year in which the annual CIO of the Year competition was started in Finland.

Porter proposed, as early as 1985, one of the earliest frameworks to consider the role of technology – and information system technology as part of it – in the creation and support of a competitive advantage in a company's processes (Porter 1985, 164-167). Despite that, the IT organisation in many (Finnish) enterprises was still seen as a support function in 2015 based on our data. One suggested reason for this is that the old-school business leaders have neither IT education nor IT skills (King 2011, 132-133). Therefore, IT was encountered as an uncomfortable and expensive function. Another reason could be the above-described insecurity experienced in power structures in technology-led business process changes. Co-operation between the IT function and the business leaders is felt to be complicated due to the lack of understanding between the parties (Boyle & Burbridge 1991, 129; Romanczuk & Pemberton 1997; Hirschheim et al. 2003, 10; Peppard, Edwards & Lambert 2011). Moreover, CIOs have stereotypically been labelled as "IT geeks" (Nolan 2012, 101) instead of credible business leaders.

While comparing the common support functions in an organisation, the biggest difference in the natures of IT and finance or IT and HR is that there are hardly any established rules on how IT work should be carried out. In finance the accounting rules are globally similar, and in HR the collective labour agreements in Finland and in the EU area dominate this work. At the same time, only the corporate governance principles, such as the OECD corporate governance (2004, revised in 2015) and the Sarbanes-Oxley Act of 2002, have forced companies to comply with the regulations and to automate processes to avoid operational risks. As the next step, robotic process automation (RPA) is proposed to be deployed to automate support processes (ACCA 2013; Deloitte 2015; Lacity & Willcocks 2015, 3). Early adopters have already started to implement the first robotic solutions in operational, repeatable finance processes (KPMG 2016; McCann 2016, 35-38). The need for manual work is expected to reduce dramatically.

IT organisations and their leaders have sustained several management changes, including the outsourcing and in-housing of IT skills, their centralisation and decentralisation and the purchasing of IT services outside the IT organisation, caused by different management principles and efforts to save

money (e.g. Hirschheim et al. 2003, 9; Lacity, Khan & Willcocks 2009). Since its emergence, the role of an IT organisation and its leader has never been stable. However, the main reason for continuous change in IT today is the development of technology itself, more specifically the business potential that IT is able to create (King 2011, 133). Organisations have increasingly begun to embrace the possibilities of IT, and consequently CIOs are invited to senior management groups. According to a global CIO survey conducted by Harvey Nash and KPMG in 2016, 34% of 3 352 respondent CIOs currently report to their CEOs and 57% of them sit on the executive board (Harvey Nash & KPMG 2016, 4). In Finland, the national IT barometer shows the same kind of results (FIPA<sup>4</sup>, IT- and digitalisation barometers of 2008-2015, e.g. IT barometer 2013, 6). These figures have been growing over time and lead us to believe that CIOs have more influence in organisations than ever before.

The backdrop of this thesis is the enormous growth of digital data and their usage in organisations. More and more businesses are being led by deploying the digital data that they possess in their IT systems. In the current business life, it is only certain that the usage of IT will continue to spread in organisations and their networks. This development will have impacts on the organisational structures, processes and employees, including the CEO and board members, in addition to the IT function and its leaders (Nolan 2012, 101).

### 2.3 The research questions

*For scientific activity, after all, depends largely on asking the proper questions in an adequate way.*

(David Mechanic 1963, 143)

Earlier research findings have shown that the tasks and role of a CIO are not stable (e.g. IBM 2011, 7; Harvey Nash & KPMG 2016, 6; Dahlberg et al. 2016a; 2016b; 2017a; 2017b; 2017c), even though IT has a ubiquitous role, at least in large organisations. IT services are used both internally and externally in interfaces with clients and business partners, and our understanding of the importance of IT has increased. As a summary of the discussion so far, there appears to be a research gap regarding how the boundaries of a CIO's work can be defined and how the interplay of these boundary factors influences the equilibria of a CIO's tasks. Therefore, our research question, filling the viable research gap, is the following:

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<sup>4</sup> The Finnish Information Processing Association (FIPA).



*RQ. Why are the tasks and the role of a CIO still not stable after all the years of the profession's existence, and how does this instability influence the tasks and the role of a CIO?*

In our articles, we found that a CIO's tasks and role were seen differently in different business areas in an organisation, which led to the following sub-questions:

*SQ1. Why are the tasks and the role of a CIO perceived differently in different business areas in an organisation?*

*SQ2. Would it be possible in general to find the boundaries for the tasks and role of a CIO?*

Our approach is based on the idea that the organisational structure is the outcome of the division of work and that the basis of work division lies in the intention to achieve effectiveness. For example, in the media business, the revenue of paper products is falling globally and digitalization is the key concept for creating business value (e.g. Artero & Manfredi 2016, 53-54). The banking sector is another example, in which the intensified competition and new entrants to the market influence the redefinition of this market for the incumbents. In Finland, the OP financial group is promoting its own hospital services to its insurance clients and its own electric car rentals to consumers in an effort to gain synergies from the insurance business (OP Kulku 2017). Goldman Sachs, one-third of the employees of which are engineers and programmers, is investing in new technologies like Mobileye (Goldman Sachs Stories of Progress Mobileye 2017). The third industry example is Über, which has disrupted the whole market of taxis with its new logic of transporting people more effectively. This new business logic is built on an IT platform providing customers with mobile services.

With these examples, it is correct to claim that businesses in several industries are facing a paradigm shift and that technology is playing a major role in this change. The proposition here is that alignment of the business and IT strategies is no longer needed, since IT is at the core of the business strategy. The concept of a digital business strategy was defined in the research by Bharadwaj, El Sawy, Pavlou and Venkatraman (2013). The digital business strategy concept influences strongly the division of work, the tasks and role of a CIO and the IT function.

### **3 THE PHILOSOPHICAL AND METHODOLOGICAL BASIS**

#### **3.1 The methodological basis and ontological stance**

Methodology is a doctrine of reasonable scientific methods (Haaparanta & Niiniluoto 1991, 93); that is, it examines the reasoning of collecting and analysing methods (Tuomi & Sarajärvi 2006, 11). The used methodology does not only force us to sharpen our thinking but also leads to problem formation of the greatest significance (Mechanic 1963, 143). Ontology uncovers our basic assumptions about reality, whether it is external or a construction of our mind (Jonker & Pennink 2010, 61). The problem is how to gain scientific information from reality, because it appears differently to different researchers depending on their approach and the tools with which they are carrying out their research work (e.g. Guba & Lincoln 1989, 83-116; Tuomi & Sarajärvi 2006).

A significant part of organisational research has been conducted relying on realism as an ontological basis (Gioia & Pitre 1990, 586), which is no surprise due to the long functionalist tradition in organisational theories (described, for example, by Burrell & Morgan 1979, 121-226). Consequently, more than 95% of information technology-related articles were positivist in their epistemological basis 25 years ago (Orlikowski & Baroudi 1991, 6; Avison 1997, 120). Even though other research stances have gradually been accepted in IS journals, positivism still represents the mainstream (Walsham 2014, 13). Since information systems science covers not only technology but also, for example, people's ability and willingness to use technology, I think that the institutions of the information systems discipline underestimate the other methodologies, like interpretivism or critical theory, in their publications. In particular, in organisational research that studies the role of an IT leader, an interpretive stance is needed to be able to understand the world that social actors like IT professionals are creating from their perspective.

I have been struggling for a long time with the questions of ontology and epistemology, because I think the functionalist paradigm simplifies the conception of human beings too much. Firstly, I believe that an organisation is such a construct, which cannot be studied as a systematically behaving function that is independent of the social interaction and be explained purely with causal connections. There is no organisation without actors, and the actors can always act against the norms, rules or managerial expectations. As Tuomi and Sarajärvi

(2006, 64) stated, qualitative traditions are based on the view that a world exists separately from the subject or the researcher and that it constitutes the nature, other people and the world *per se* but not the social reality. They continued that social reality is dependent on meanings, interpretations and other constructions in mind. That is also my understanding of the world and particularly of the organisations functioning via social action. We obtain information on the world only through our own perceptions, and these may vary in a single situation in a social world among actors.

Secondly, positivism's fundamental ontological premise, as understood in natural sciences, is that an actual reality and only one truth exist, and they can be discovered by the methods of science. This actual reality operates according to a series of natural laws (Lincoln, Lynham & Guba 2011, 108, 114). Basden (2011, 481) added that positivism postulates that the world functions by invariant, causal and largely mechanical laws. According to my understanding, organisations are intangible social constructions, in which the universal truth is unattainable. Instead, and also according to our collected data, these constructions are social, created realities built by social actors, like the CIOs interviewed, from among the situations and events of their experience. These actors are rooted in their beliefs, values, fears, prejudices and other such factors that affect them (Guba & Lincoln 1989, 143). At the same time, the discourse between actors continuously maintains reality and continuously modifies it (Berger & Luckmann 1971, 173); thus, reality is socially constructed (Berger & Luckmann 1971, 13).

Thirdly, social structures like organisations emerge constantly from structuring activities, and these processes make them visible and influential (Gioia & Pitre 1990, citing Mehan and Wood 1975, 592). In other words, organisations are not inherently stable external objects but constructions, which are negotiated and are seen differently by social actors both internally and externally.

Fourthly, positivism discards the humanity of the researcher and dogmatically gives precedence to analytic and quantitative rationalities (Basden 2011, 485). However, according to Becker (1967, 239), we cannot avoid taking sides while researching social structures, even when we are not conscious of doing so. There is no value-free science; the researcher always has a stand according to her/his worldview (Denzin & Lincoln 2011, 5). Becker (1967, 245) continued by citing Mead, who said many years ago that the scientist who has the intention to understand society must be sufficiently immersed in that situation to have a perspective on it. Gummesson (2000, xi) requested researchers to rely on their personal values and awareness of their own paradigm and contests as well the idea of being a neutral observer in a social situation (2000, 135).

In my research, it is evident that I am heavily involved in my research object, having been leading IT organisations as a CIO for more than fifteen years. Instead of only observing and examining the research object, I am not only taking part in

the actions in my organisation but also leading them. Therefore, my aim is to understand the constructions that actors (including myself as an inquirer) hold, seeking a shared understanding but still open to new interpretations as information and sophistication improves (Guba & Lincoln 1994, 113).<sup>5</sup> I am also aware that my preunderstanding, which implies a certain attitude and commitment, may affect or even restrict the capturing of new information (Gummesson 2000, 16, 60). To avoid that obstacle, I use the reflection technique mentioned before as well as the hermeneutic circle (Klein & Myers 1999, 71) as a cumulative learning process. In addition, as part of the learning process, my own understanding evolves through the discussions and analyses within our research group, having a significant preunderstanding of the IT field.

With this grounding, we posit that our qualitative research is near the border of the interpretive and functionalist stance in Burrell and Morgan's (1979, 29) field of four sociological paradigms (Figure 1, the star indicating this work). The rationale for this alignment is that we are using some methods from quantitative tradition, such as semi-structured questionnaires (Gummesson 2000, 125) in the interviews.

As a summary of the discussion above, our approach is interpretive, and the impact of this choice on the methodology of the research is described in the following chapters.

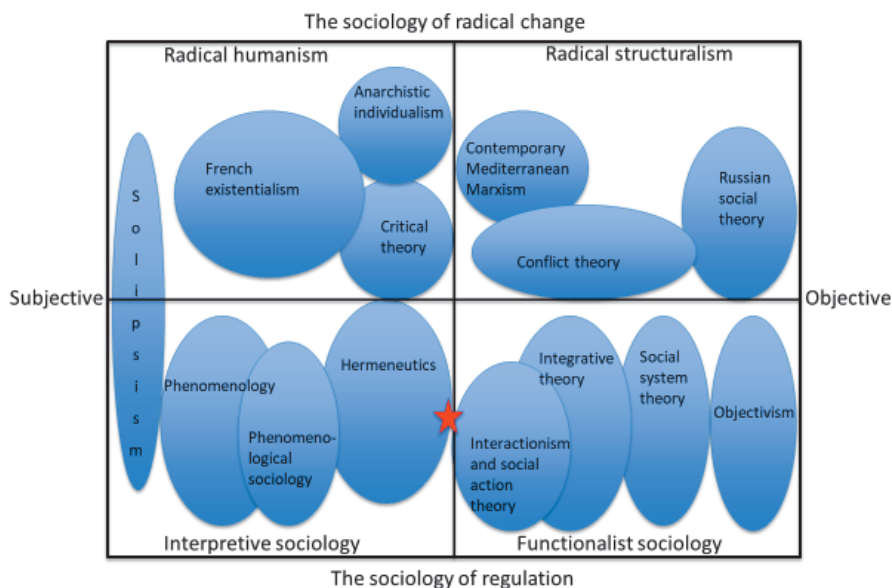


Figure 1. The four sociological paradigms (Burrell & Morgan 1979, 29)

<sup>5</sup> Guba and Lincoln's (1994) constructivist answer to the question "What is the purpose of an inquiry?".

## 3.2 Longitudinal research and quality criteria

Having the research interest of understanding the change factors of CIO work and IT organisations led me to think of the longitudinal approach, in which interviewing both first-generation IT leaders and new digital-aimed IT leaders plays an important role. The first-generation IT leaders had no pre-education of IT, because it simply did not exist in the 1960s and 1970s in high schools in Finland. The digitally aimed IT leaders learned IT at high schools or universities and had laptops and/or mobile phones before they started their working life. I consider myself to be a first-generation IT leader, because I started to work in the IT sector in 1979 and the academic training in the field started seriously (having more than one professor) in the 1980s at the University of Helsinki (Laitoksen historia: The birth of the Department 2017). By interviewing both groups of IT leaders, the idea was to understand the possible differences in their answers due to age, work experience and educational background.

The other reason for adopting the longitudinal approach was that the research question cannot be answered without it, because the time frame is essential when studying continuous change. Due to this continuous change, the hermeneutic circle is used to deepen the understanding of the research target. As Gummesson (2000, 202) stated:

*The hermeneutic paradigm exercises a major influence of research concerning processes of change.*

The quality criteria differ remarkably between paradigms, especially between positivistic and interpretive stances. The quality of research is the degree to which we comply with the specifications set up in our research design (Gummesson 2000, 160). In the next chapters, I describe the main differences regarding the quality in positivistic and interpretive research and in our own choices.

### 3.2.1 About reliability and objectivity

The problem in longitudinal and interpretive research as a whole is reliability from the positivistic point of view. How reliable are the memories of interviewees? How objective is the interpretation of the researcher? How can the results be validated? Every organisation is unique, and every story told, even in the same organisation, is different. The real issue behind these questions is how it is possible to obtain truthful knowledge of the world. I think that the knowledge of a social world, more precisely the organisations in this study, cannot be separated from the knowers (Guba & Lincoln 2005, 204). Furthermore,

knowledge consists of those constructions about which there is relative consensus among those competent to interpret the substance of the construction (Guba & Lincoln 1994, 113).<sup>6</sup>

As a summary, according to my understanding, there is no absolute truth to be found in the social world. Gummesson (2000, 141) stated that the truth is context dependent and thus has to be relative. Klein and Myers (1999, 72) included the principle of contextualisation as the second principle in interpretive IS field research, asserting that one of the key tasks is to seek the meaning in context. That was our aim in the articles that we selected for this research.

Since there is no such thing as absolute truth, the credibility of this research is built using triangulation in methods by analysing the data collected by our research team, first individually (subjective reflection) and then in intersubjective dialogues both with the interviewees and with research colleagues, seeking consensus on the findings. In addition, we also described accurately the process of interviewing and analysing the data collected. With these methods, we aimed to maintain the plausibility of subjective reality. As Berger and Luckmann (1971, 174) stated, subjective reality is always dependent on the particular plausibility structures required for its maintenance. Thus, within this context, quality is both intangible and subjective (Gummesson 200, 164) and in interpretation subjectivity is recognized and hence objectivity is not attainable.

### ***3.2.2 About validity and generalisations***

Klein and Myers (1999, 75), in their principle of abstraction and generalisation citing Walsham (1993, 15), notice that validity depends not on the representativeness of cases in a statistical sense but on the matter of how plausible and convincing is the logical reasoning used in describing the results and in drawing conclusions from them. Walsham (1995, 79) presented four types of generalisations in interpretive research:

*1) the development of concepts, 2) the generation of theory, 3) the drawing of specific implications, and 4) the contribution of rich insight.*

However, he stated that social phenomena are always dependent on their actors and situations, which both change in time and space. Therefore, these types of generalisations are merely generative mechanisms that should be seen as valuable explanations of past data rather than predictions of future states (Walsham 1995, 79). Yin (2014, 21) continued by asserting that

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<sup>6</sup> Guba's and Lincoln's (1994) definition of knowledge from a constructivist stance.

*case studies [...] are generalizable to theoretical propositions, but not to populations or universes.*

In our research, we worked with the development of concept in our case study that is published in our fourth and fifth articles. We explained the differences in interviewees' narratives of three levels in an organisational hierarchy by adding the constructs of Granovetter's (1973; 1983; 2005) social network theory to the punctuated equilibrium model drawings of the interviewees. This work is described in more detail in chapters 4.4 and 4.5 in this thesis. We think that this concept could be a useful tool in organisational studies seeking explanations for the contradictory views of the actors in an organisation. However, our purpose was not to generalise the outcome but to explain the different views of actors at different levels of the organisational hierarchy in our case study.

### **3.3 The theoretical frameworks of my study**

#### ***3.3.1 The hermeneutic circle leading the interpretation process***

In this interpretive research, the theories are used as lenses through which the world is seen instead of being tested as in positivist research (see, for example, Klein & Myers 1999, 75). The theories are used to explain the findings as well as to give an understandable structure to the results. The outmost theory combining the frameworks used in the articles is the hermeneutic circle. It is used for developing the understanding of the research questions. In the hermeneutic circle, an understanding of the parts presumes the understanding of the whole; it is an iterative process whereby each piece of the process provides new knowledge (Gummesson 2000, 70). Klein and Myers (1999, 72) stated that the hermeneutic circle suggests that

*all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form.*

They also stressed that this principle of human understanding is fundamental to all the other principles in interpretive field research. The interpretation process as a hermeneutic circle in this research is described in Figure 2.

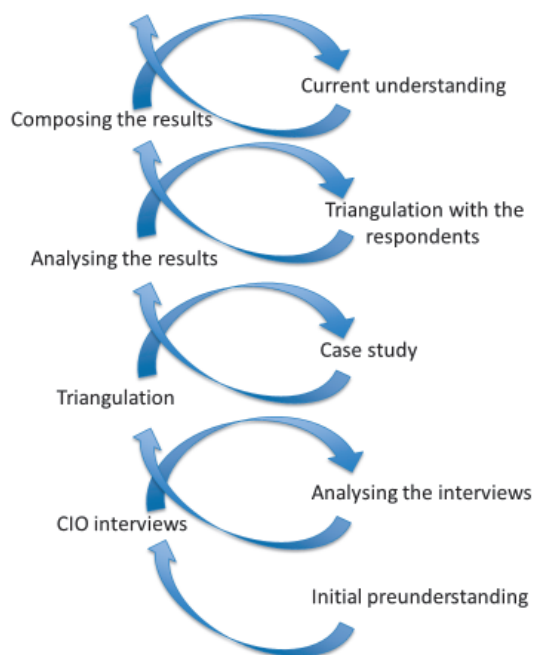


Figure 2. The hermeneutic circle leading our interpretation process

Our data are a collection of interviews, and the hermeneutic circle offered us a framework for composing an understanding of what was told to us. It also guided the iterative process of constructing the answers to our research questions of “why?” using triangulation and case study methods. The hermeneutic circle fits our purpose better than, for example, conceptual analysis, which seeks to analyse the meanings of the concepts and create a shared understanding of them and their use<sup>7</sup>.

However, during the research, we also used methods that are common in positivistic approaches as stated already earlier. According to Lincoln, Lynham and Guba (2011, 116), at the philosophical or paradigmatic level the positivist and constructivist worldviews are incommensurable, but within a paradigm mixed methodologies can be used successfully. Gummesson (2000, 184) added that hermeneutic and positivistic concepts are not opposites excluding one from another but rather complements. In fact, in a study of controversies in mixed-methods research, Creswell (2011, 275) even suggested that multiple paradigms related to different phases of a research design could be used by linking paradigms to research designs.

With the first data set, we used triangulation of researchers (cf. Denzin 1978, 291-305) while analysing the interviews and our results. Two or three members

<sup>7</sup> The definition of conceptual analysis is from Wikipedia ([fi.wikipedia.org/wiki/käsiteanalyysi](https://fi.wikipedia.org/wiki/käsiteanalyysi)).



of our research group made their own interpretation of the analysis, and afterwards a consensus was formulated. The aim was to provide a fuller picture of the issue at hand.

With the second data set, we enhanced our method for creating a shared understanding. First, the inquirer interviewed the respondent, who was able to see all that the inquirer wrote during the interview via the projector and had the possibility to correct the outcome immediately. Then the inquirer shared the interview with the research group, and it was analysed against the theoretical frameworks used. Third, the inquirer constructed a narrative and the graph from the interview using the frameworks and the feedback from the other researchers. Fourth, the inquirer shared the narrative with the respondent, who again had the possibility to change the outcome. Through these steps, we attempted to gain a shared understanding between researchers and respondents (Figure 3).

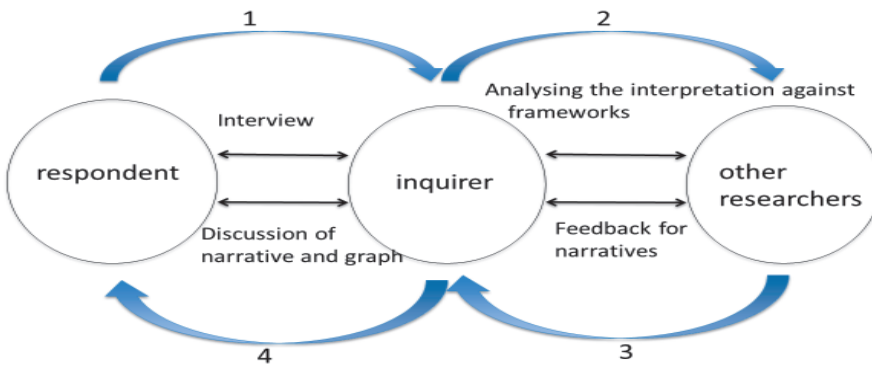


Figure 3. Creating a shared understanding

We assessed our approach as increasing the plausibility of this research. In the articles, we used three theoretical frameworks, which I present next.

### 3.3.2 *The Leavitt model of applied organisational change*

The first framework that we used in the articles is based on the Leavitt model of applied organisational change, also known as Leavitt's diamond (Leavitt 1965, 1144-1170). We used the Leavitt model as part of an iterative process of data collection and analysis, not as an initial guide to design the research and collect the data (Walsham 1995, 76). The Leavitt model identifies four factors, which describe major organisational elements that have a presence in all organisations. These factors are dynamically and mutually interdependent. This means that, if one of the factors changes, all the other factors change as well. The change may

be intended or unforeseen (Leavitt 1965, 1145). Leavitt defined these factors as structure, task, people and technology, as described in Figure 4.

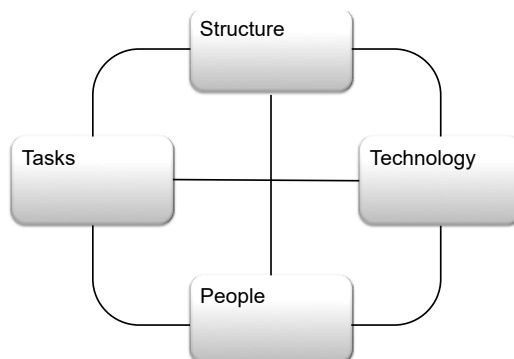


Figure 4. The Leavitt model of applied organisational change (Leavitt 1965, 1145)

The Leavitt model has been used numerous times since its creation. Scott Morton (1991, 20) used Leavitt's theory as a basis for the creation of a framework for MIT's 1990s programme concerning twenty-first century organisations (Figure 5). The aim of the programme was to examine information technology's impact on organisations. That framework consisted of structure, people (as individuals and roles) and technology factors, but tasks were changed to management processes due to the managerial stance of the framework. The strategy factor was added as one of the mutually interacting factors emphasising the importance of constant innovation and improvement. Furthermore, structure, processes and people were grouped together, formulating the culture of the organisation.

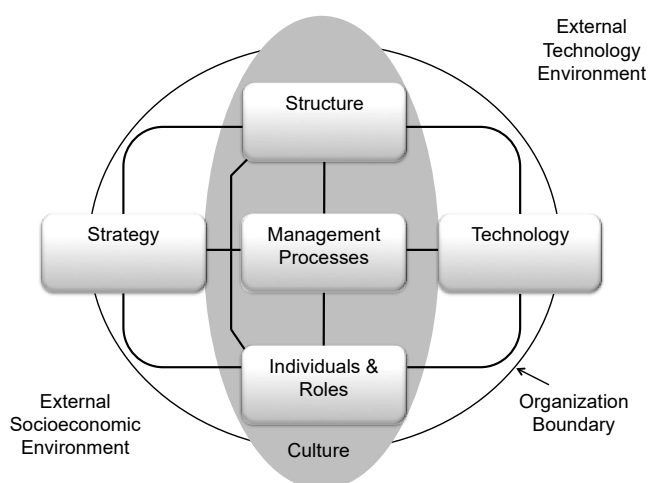


Figure 5. The corporation of the 1990s (Scott Morton 1991, 20)

Scott (2003, 18) extended the Leavitt model by placing the organisation in its environment and thus adding the fifth factor to it. He also changed the structure factor into the social structure factor, stressing that the concept of structure carries a static connotation, and he wanted to emphasise the dynamic nature of the structure (Scott 2003, 20). Wigand's (2007, 3) interpretation of the Leavitt model concerns how an organisation redesigns itself by focusing on management processes, structure, strategies, people and tasks to meet the demands of such external forces as technology and changing markets. Kimpimäki (2014, 41) extended the Leavitt model using Scott's idea of the environment and social factor element. He also stated that all four of Leavitt's factors are both internally and externally shared. He placed a new information element into the model as an internal core factor with an emphasis on enterprise architectures in his dissertation work (Figure 6).

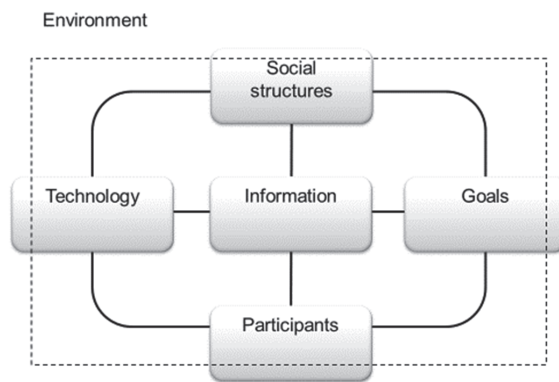


Figure 6. Kimpimäki's extended organisation model (Kimpimäki 2014, 41)

We selected the Leavitt model as our theoretical basis of organisations because it is a generic model for organisational evolution. The CIO is a role containing an organisational development task, and therefore this kind of evolutionary model fits this study well. The model also describes the factors that have an impact on the work of CIOs in constant change. It is usable regardless of industry, time frame, changing IT and organisational environments or management paradigms. Our first collected data set supports this claim. We interviewed thirty-six CIOs in six different industries during the years 2006-2013 and found the Leavitt model to be a useful framework for the initial setting and order for analysing the data. We claim that this kind of generic model offers both researchers and practitioners a robust means to define the factors that shape the work and the organisational role of the CIO within a specific enterprise.

However, after Leavitt's time, new concepts, such as business models and corporate governance rules, were introduced and became established parts of management and structuring activities. In addition, for CIOs technology

contemporarily consists of IT technologies, services and information, and tasks are understood as part of processes. Therefore, we enlarged the wording of structure to strategy, business model and governance; task to tasks and processes; and technology to technology, IT services and information. However, we did not assess these changes as extensions but merely as updates to the original model. (Dahlberg et al. 2016a; 2016b; 2017a.) Our modified Leavitt model is presented in Figure 7. We used this modified Leavitt model as a backbone for all our articles, because it holds constant change as a premise in organisations.

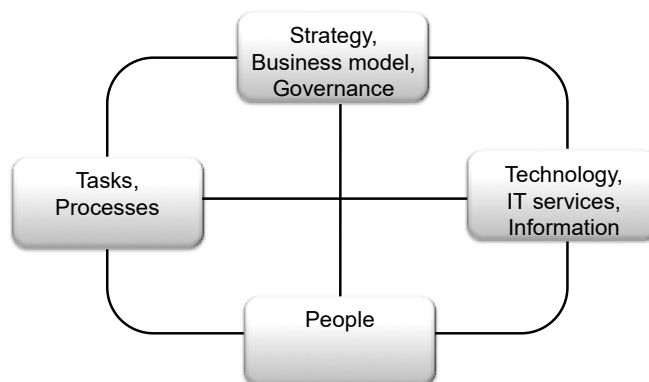


Figure 7. The Modified Leavitt model (Dahlberg et al. 2016a, 4912)

### 3.3.3 *The punctuated equilibrium model*

The second framework that we used in the articles is the punctuated equilibrium model, which was proposed by the natural historians Eldredge and Gould in 1972 (Gersick 1991, 11). This model exploits the Leavitt model as an organisational diagnostic model to describe work transformations after punctuations (Dahlberg et al. 2017b; 2017c). Organisational diagnosis means that the organisation's current status is assessed to enhance efficiency, for example with better deployment of a specific technology or IT management improvements (Dahlberg et al. 2016a; 2016b; 2017a). The equilibrium model was introduced in 1916 by Pareto. He saw the society as a system of interrelated parts, which were in a state of equilibrium even though they were in continual flux, moving away from the equilibrium and then changing and tending to restore the balance. Pareto used the model as a scientific construct for the analysis of social reality. (Burrell & Morgan 1979, 47.)

The model can also be seen as an evolutionary model of organisations (Tushman & Romanelli 1985, 173). A stable equilibrium in an organisation behaves in a regular, predictable manner (Stacey 1996, 5) whereby people behave as expected and according to the norms. In incremental transformation,

the change is continuous and cumulative in an organisation (Orlikowski 1996; Sabherwal, Hirschheim & Goles 2001; Lyytinen & Newman 2008). This incremental change does not disturb the organisation's success, because such change is identified early enough and the organisation is enabled to align with them. The system stays in control. (Stacey 1996, 5.)

A transformation may also contain critical event changes, the change itself being radical, revolutionary and often sudden (Orlikowski 1996; Sabherwal et al. 2001; Lyytinen & Newman 2008). Such critical events break the evolutionary and incremental nature of the ongoing work evolution and are thus interruptive. Interruptions, also called punctuations, are socio-technical in nature (e.g. Lyytinen & Newman 2008, 594). The term socio-technical refers to the interaction of technological and social factors. Figure 8 describes the logic of the punctuated equilibrium model before and after an interruption.

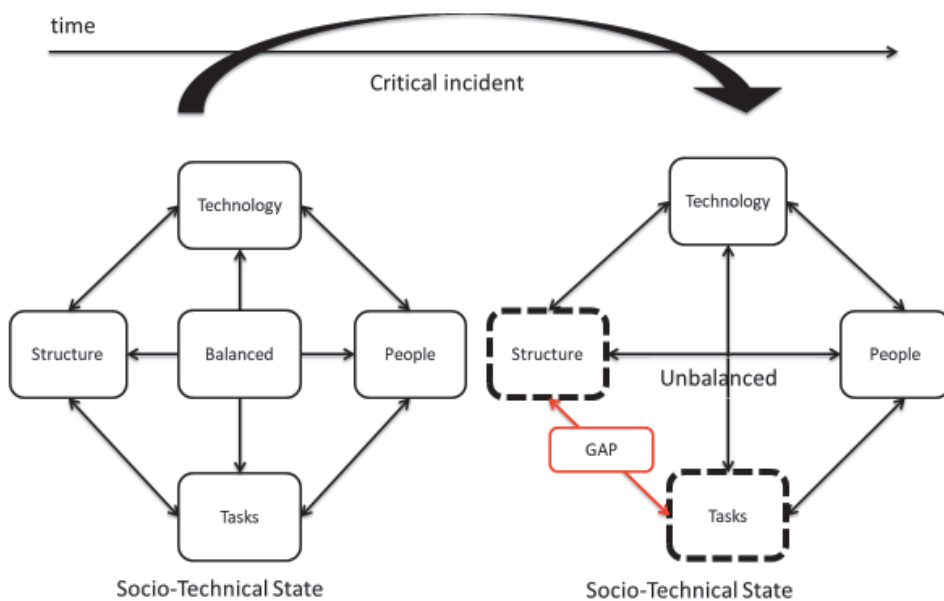


Figure 8. An event model for socio-technical change (Lyytinen & Newman 2008, 598)

A characteristic of the model is that it does not assume any positive intrinsic development for the change; it only describes the equilibrium as not being immutable. In our study, we used the model to describe how major change events, that is, business interruptions, influence the work of the individuals in an organisation, especially the CIO.

### ***3.3.4 The social network theory constructs***

Our fourth and fifth articles were completed using a case study method in a media company environment. In this research, it was clear after the first interviews that different actors in an organisation do not initially share an understanding of the means to implement commonly agreed central goals, like growth and profitability, the common strategy or even what has happened and why. As Silverman and Jones (1973, cited in Burrell & Morgan 1979, 268) emphasised, the respondents' views are characterized by multiple realities in interview situations. They indicate that reality is seen differently among actors in social contexts.

To show this clearly and simultaneously to obtain an explanation for why the initial setting was like that, we used Granovetter's theory of social networks (Granovetter 2005). People in organisations belong to different social groups, and these groups are connected with weak or strong ties formulating the social network. The strength of a tie affects the flow and the quality of information between individuals in a network. Strong ties describe the information flow within a certain social group and produce shared views in that group. Weak ties between social groups in turn provide access to information beyond that available in people's own social groups. Granovetter's social network theory resembles Stacey's shadow social group network construct (1996, 26-28), which consists of the informal and political ties of the individuals in an organisation. However, in a shadow network, according to its definition, individuals as social actors develop their own local rules of interaction with each other, and the shadow network serves a multitude of diverse purposes, not being utilized at the moment for its main purpose.

In our research, the basis is first a legitimate hierarchical structure in which the social actors belong to separate social groups that follow this legitimate structure. As a consequence, these social groups share the norms of their group and behave according to the groups' normative expectations, which are also recognised in Granovetter's (2005) definition of dense social groups.

Secondly, Granovetter's (1973) construct of weak and strong ties describing information flows within social groups was a useful explanation in our case study. It helped us to understand why different social groups may have different perceptions of the tasks and role of CIOs. In our case company, the business units, as organisational silos, were strong and had their own priorities. In these circumstances, they used their structural power over the CIO and her centralized IT organisation.

Thirdly, the construct of a structural hole explains the lack of a tie between social groups and therefore hinders information exchange within these groups

(Granovetter 2005). For these reasons, Granovetter's (1973; 1983; 2005) social network theory fits well with our concern.

In summary, we used three theories in this research. The Leavitt model, as a theory of an organisation's interrelated factors, was the basis for all of our articles. That theory was complemented with the punctuated equilibrium model, which was used to describe the impact of major changes in an organisation. The constructs of Granovetter's (1973; 1983; 2005) social network theory were used together with the punctuated equilibrium model. The aim was to comprehend better why the different actors in an organisation have different understandings of the company's goals and their implementation.

### 3.4 The empirical research strategy and methods

Our research group consists of three persons: I am a full-time CIO and PhD student, another member is a PhD researcher at a university, who also has CIO experience, and one is a professor at a university. At the time of writing the first article, the group also had a fourth member, another PhD student. We share an interest in understanding how IT is led in organisations and why the tasks and roles leading IT are not stable. All our selected articles in this dissertation concentrate on these topics.

Given the kind of topic and the interpretive stance, the interview method was a natural choice for collecting the data. As Denzin (2001, 25) described:

*The interview is an active text a site where meaning is created and performed. When performed, the interview text creates the world, giving the world its situated meaningfulness.*

Denzin (2001, 30) continued that the interview is not an interpretation of the world per se, but it stands in an interpretive relationship to the world it creates. We agreed to use written material as well, such as the annual reports from the companies that the interviewees represent, to complete the facts about the companies, such as the yearly revenue and the amount of personnel. We conducted semi-structured interviews; that is, we followed a manuscript but we allowed the interviewee to complement the data if s/he so wished.

Myers and Newman (2007, 4) encouraged the agreement in advance of the level at which the researcher enters into the organisation, because it could be difficult to interview senior managers after interviewing the lower-ranked representatives. In our research, the target group, CIOs, was clear from the beginning, even though we ended up interviewing the CIO's supervisor as well in our case study research. We found that, at least in our case, the CIO's supervisor

was interested in our topic and agreed to take part in the research without hesitation.

### *3.4.1 Interviews for selecting and collecting data*

In our research, phenomena were studied retrospectively by interviewing people, more precisely CIOs, who reviewed their own history. According to Klein and Rowe (2008, 678), doctoral students with long experience in practice are more likely to be able to understand cultural and professional contexts and thus correctly interpret the beliefs and opinions of the study participants. Because two members of our research group belong to the same professional group as the interviewed CIOs, we can state that we had a preunderstanding of the topic. Furthermore, our own emerging understanding of the phenomena complemented the data collected.

As described later on, our interview method was also developed during the time of the interviews to support the accurate interpretation. We started with open questions, with which the respondent had the freedom to report broadly anything that he wanted. While analysing the method after the first interviews, we made changes to the questions and started to show the written outcome of the interview immediately to the respondents. With the second data set, we also enhanced our interpretation process. Instead of interpreting the interviews within the research group, we took the interviewees into the interpretation process. Accordingly, we deviated from the organisational ethnography tradition of first-order and second-order concepts, of which the first-order concept is the interviewee's construction and the second-order concept the researchers' construction (Walsham 1995, 75).

We collected two sets of empirical data for this research. The first set includes thirty-six CIO interviews in private sector companies in six industries: media, public sector organisations, finance, manufacturing, retail and services. This data set can be classified as panel data containing perceptions of multiple phenomena obtained over multiple time periods for the same individuals<sup>8</sup>. The selected interviewees answered the questions from two different time frames in the same interview. Almost all the questions were formulated so that the first question asked how things were when the respondent started her/his career and the second question asked how things are now (at the moment of the interview). Using this method, we obtained a large sample of data for the years 2006-2013. The profiles of the interviewed CIOs, the interview dates and the interviewees' experience,

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<sup>8</sup> The definition of panel data is from Wikipedia ([https://en.wikipedia.org/wiki/Panel\\_data](https://en.wikipedia.org/wiki/Panel_data)).



gender and age group, as well as the size of the organisation that they represent, are presented in Appendix 1.

The other set was collected with the same kind of interview method, using a semi-structured interview template and a projector but a different method of analysis. The second data set concentrates on business strategy changes in a case study of a media company. In this study, we interviewed some of the actors several times to gain a more complete picture of the events and the circumstances of the IT leadership in the company. The interview dates, the place of the interview, the role of the interviewee, her/his supervisor's role and the work unit of the interviewee are presented in Appendix 4.

### ***3.4.2 The first data set and an enhanced interactive multi-stage interview method***

We started the interviews by conducting a test interview with the first IT manager ever in a Finnish retail company in October 2006. From the beginning of the interviews, they were all recorded. Each of the respondents was asked whether s/he would allow us to record the interview, and none of them refused. The researcher did not perceive any foreseeable inhibitions due to the recording. We used a questionnaire containing 34 open questions, seeking answers concerning the IT manager's tasks and role and the changes to them, also taking into account the changes in the business. The interview took several hours, and much was discussed very freely, the interviewee also posing questions for me (the inquirer). Following this interview, we made some modifications to our questionnaire, ending up with 58 questions. The aim was to approach a semi-structured interview. The next 4 interviews took place almost a year after the first. Again these interviews lasted for several hours, and the discussions proceeded so that not all the questions were answered but the stories were long and amusing. The issue was the lack of answers or twisting stories in response to some questions. Even though the stories were rich, this ethnographic method did not offer us the answers that we sought.

Therefore, we conducted the next interview in 2009 with a slightly different technique. The questionnaire was the same, but we used a projector to show the questions to the interviewee, and thus s/he also saw what the researcher typed onto the questionnaire regarding her/his answers. This changed the interview process; the interviewee was more conscious about the story s/he told, and, more importantly, s/he had the possibility to correct the outcome immediately. The interview time was also shortened, and the questionnaire structure was adhered to better, which also led to easier analysis in the sense that all the questions were

answered, albeit with shorter answers. Klein and Rowe (2008, 681) stated that a professionally qualified doctoral student is

*more capable of anticipating the time required, managing the duration of the interview and bringing the interviewee back to the subject.*

For us it took time to allow the interviews to settle down as we preferred. One reason for that was probably the fact that the interviewees and the inquirer were colleagues and the interviewees did not feel tense but mainly wanted to exchange experiences. Knowing that the interview situation is always unique, with a certain amount of disturbance and influence (Becker 1996, 7), we think that the projector technique aided us in focusing on the questions. After the projector technique was incorporated into the interviews, they ran smoothly and in accordance with our interview strategy.

After analysing these initial interviews, we discussed the change within the research group, and we agreed to follow the new interview method later. However, we modified the questionnaire so that the questions that seemed to repeat questions already asked, according to the first interview analyses, were omitted; hence, the questionnaire contained 51 questions. The next interviews were executed during the years 2011-2013. One further change was made to the questionnaire at the beginning of 2012 due to the analyses and our emerging understanding of the important issues. The question "How does technology's change affect your company's strategy?" was added to the questionnaire. During the years 2011-2012, the fourth member of our research group also took the interviewer's role in some of the cases. Both interviewing researchers had the same kind of professional background, and it was quite easy to "blend into the scene" and understand the jargon used by the participants (Klein & Rowe 2008, 681). This also strengthened the interviewees' opportunity to give relevant answers in the interview, and thus we estimated that Gummesson's (2008, 58) concern about the lack of researchers' preunderstanding was avoided. All these interviews were performed in either the interviewees' or the interviewers' workplace.

After each interview, the text was completed from the record and then sent to the interviewed participant, except the very first ones, for which the interviewing technique was different. S/he then had the possibility to modify the original text by means of verifying the authenticity of the answers. Simultaneously, the participant interpreted the researcher's written text. Some of the participants wanted to add to or change something in their stories, but mainly the transcripts were accepted as they were.

Our goal for these interviews was to understand how the role and tasks of CIOs were defined in different industries and how changes in the organisation influence CIOs' role and tasks. We started with the ethnographic method of open

questions and long discussions with the interviewees, ending up with a well-structured time-respecting model of the interviews, sharing the data from the beginning with the interviewees. The final questionnaire is presented as Appendix 2. As described above, the interview process was also a learning process for the researchers regarding how to carry out interviews with C-level respondents so that the actors feel that they are creating value and the researcher achieves the desired outcome within the agreed time. We think that we enhanced the traditional interview process substantially with this new method of interviews.

The first three articles are based on these interviews.

### ***3.4.3 Analysing the interview material***

Having the preunderstanding that CIOs in different companies do not share the same role and that their tasks differ from company to company, we wanted to research why the tasks and the role of CIOs did not stabilise during these years. That was also formulated as our main research question. We started the work by researching the factors that exert an impact on the role and the tasks of CIOs, and at this point we chose the Leavitt model as our theory basis.

Bergman (2008, 7)<sup>9</sup> stated, in his article on mixed-methods research, that the analysis techniques do not require a particular view of the nature of reality, determine the truth value of data or limit the use of compulsory analysis techniques. He continued:

*The decision on whether the researcher deals [...] with one single reality, a constructed reality, multiple realities, multiple constructed realities, a co-constructed reality between the researcher and the researched, or no reality at all is unrelated to whether patterns in the data are detected via statistical analysis or otherwise.*

However, the understanding and analysis of the data must be consistent with the research focus, context and design. In our case, we had thirty-six transcripts answering about fifty-one questions and other comments that the interviewees made. While reading those transcripts and trying to compare what we had been told, we agreed to create a matrix so that we had thirty-six answers to each question on the same row. With this huge matrix, it was easier to analyse and classify the answers in accordance with the theoretical framework of the Leavitt model.

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<sup>9</sup> Bergman 2008, Chapter 1, page 7 in online-version.

First, we analysed the interviews by counting the similar answers that we received to each question. We also counted how many different groups of similar answers we received. For example, how many different skills in a certain period of time were needed in the IT function and how often a certain skill was mentioned. Then all the researchers independently classified the impact of each factor of the Leavitt model on a CIO's role and tasks into weak, mediocre or strong for each answer. Subsequently, the interpretations were compared. Differences in the interpretations were discussed in the research group<sup>10</sup>. There were no big (weak-strong) differences, and a consensus was reached after the discussion. The classified responses are presented in Appendix 3.

In summary, several interpretations were made throughout the process. The first interpretation was made in the actual interview, when the interviewee constructed her/his story by reflecting on the issues raised in the interview event (Myers and Newman 2007, 5). The inquirer, who wrote the transcript from the original interview template and listened to the recording, constructed the second interpretation. The third interpretation took place when the interviewee checked the transcript. The fourth interpretation was made by the research group when analysing and classifying the answers. The final interpretation was undertaken while agreeing the consensus within the research group. At this point, it was clear that the tasks and the role of a CIO varied substantially between our researched companies.

#### ***3.4.4 The case study***

After compiling the CIO interviews and articles composing the collected data, our research group agreed to delve deeper to understand why the tasks and the role of a CIO did not stabilise during these years. We agreed to adopt a case study approach as a means of complementing the emerging understanding of the instability of the CIO role. As Basden (2011, 484) said (explaining Dooyeweerd's philosophy), good knowledge comes not through theoretical thoughts but through engagement with the world; the human activity of knowing is multi-aspectual. We tried to follow this multi-aspectual demand. According to Yin (2014, 4), the need for case study research arises from the desire to understand complex contemporary social phenomena and when the main research question is "why". That is exactly in line with our desire. Gummesson (2000, 84) presented two types of case studies: one attempting to derive general conclusions and one seeking to reach specific conclusions regarding a single

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<sup>10</sup> All in all there were 144 answers and 16 of those (11%) needed to be discussed.

case. Our case study was the latter type. Working in such a way, we also wanted to avoid redundancy of methods by choosing a case study as the basis for collecting and analysing the data and thus adding credibility to this work. The other option would have been to interview the same CIOs again with the exception of choosing only those who reported strategic business disruptions in the first data set.

The second data set was collected from a company that had acquired another company, and the CIOs in both of these companies were involved in our first data set collection. Within this case, we studied the impact of strategic business disruptions, like acquisitions, on the role of a CIO. The interviewees were gathered from three levels of the organisation: the CIO's supervisor (CFO), the CIO herself and her subordinates, including the former CIO of the acquired company. This time we first conducted an interview round containing eight interviews. The interviewees also included all the direct employees of the CIO. Three of them worked in separate business units, and one represented logistics organised in a matrix to the business units. One was the CFO, and three others worked for centralised IT in different roles. After each interview, the text was first verified from the recorder, and then the transcript was sent to the interviewed participant. The interviewees thus had the possibility to modify the text, and some of them took the opportunity. The questionnaire for the second data set is presented as Appendix 5.

All these interviews except one were conducted on the media company's premises. One interview was conducted using a virtual negotiation tool. The interviewed person was at home, and the questionnaire and the written notes of the inquirer were seen on the screen beside the faces of the participants. The virtual negotiation tool affected the situation in that the interviewed person concentrated more on the questions and the answers written by the inquirer than those who saw the questionnaire on the wall and discussed issues more clearly with the inquirer.

Klein and Myers (1999, 74) stipulated the principle of interaction between the researcher and the subjects. The participants may have different roles:

*Participants are interpreters as they alter their horizons by the appropriation of concepts used by IS researchers [...] interacting with them, and they are analysts in so far as their actions are altered by their changed horizons.*

This principle was implemented especially in this case study data set collection. In the case study, the interviewees had the opportunity to read and comment on the researcher's interpretation of the original interview, and three of them also took the opportunity to make their own interpretation of the narrative created by the researcher in the second round of interviews.

We also noticed that the way in which we treated the second data set allowed more efficient handling of the interview data and thus enhanced the analysis. In particular, the visualisation of the equilibria was based on validated data triangulated several times by the participants and researchers. That helped us to create a shared understanding between the participants and the researchers. This method surely increased the accuracy of the research data and their interpretation. The fourth and fifth articles are based on this data collection.

### 3.4.5 *Analysing the case study interviews*

The case study data were analysed in three stages. During the first stage, after the first round of interviews, we drew a map of the events mentioned in chronological order in the researched time frame. That map created a big picture of important events as narrated by the interviewees. We also created chronological matrixes year by year of the interviewees' answers to each question so that the answers could be compared. At this stage of analysis, we noticed that the stories told were quite different, even though certain events, like mergers and acquisitions, were of course the same in different stories. Due to this perception, we agreed to add the sub-question "Why are the tasks and the role of a CIO perceived differently in different business areas in an organisation?" to this research.

Having adopted an interpretive stance in our research, we needed to be careful with issues related to subjectivity and meaning construction. As Holstein and Gubrium (1995, 4)<sup>11</sup> emphasised:

*understanding **how** the meaning-making process unfolds in the interview is as critical as apprehending **what** is substantively asked and expressed.*

While the epistemological status of interview data is a concern in interpretive research, it is important to be clear about what is being asked and what is being answered by the interviewee. To strengthen the meaning-making process, we decided at the second stage to create personal equilibrium figures and narratives for three of the participants, namely the CFO, the CIO and the former CIO. These three participants represent a legitimate hierarchy of IT decision makers in our case company. The aim was to create an understanding of how these three people in different layers of the organisation saw the equilibrium of their own tasks and role in the company. These narratives and figures of equilibrium were discussed separately with the three participants in the second interview round – each of

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<sup>11</sup> Holstein and Gubrium 1995, Introduction, page 4 in online-version.

them saw only her/his own narrative and figures – and again they had the possibility to change the narrative and the interpretation of the equilibrium. The participants accepted the narratives and figures; the only change was to add some insight into the stories, but nothing was changed or removed.

With this method, we deviated again from the organisational ethnography tradition of interviewing and interpreting (Walsham 1995, 75). We wanted to create a consensus of the analysis with the respondents instead of trying to find any hidden meanings in the texts or overinterpret the outcomes. Working this way also gave the participants the confidence that they were understood in the complex setting of an organisation.

In the third stage, we used Granovetter's (1973; 1983; 2005) social network theory to investigate why both the narratives and the visualised equilibrium figures differed so clearly. The interpretation was discussed and assessed among the researchers to accomplish the shared understanding. Having performed this kind of analysis in three stages and involved the interviewed key persons to verify their own narratives and equilibrium figures, we concluded that the outcome was both accurate and broad in the sense of knowing about a wide range of matters to be able to answer the research questions and draw the final conclusions. The triangulation covered not only the researchers but also the selected interviewees in a certain phase.

## 4 ARTICLES

In this chapter the articles are briefly introduced and the research objectives and findings are presented. The first three articles are based on the first data set containing thirty-six CIO interviews. The next two articles investigate CIOs' work equilibria in greater depth, and the first data set is enriched with the second data set covering the CIO and her subordinates and boss in a media organisation.

### **4.1 Article 1. How business strategy and changes to business strategy impact the role and the tasks of CIOs: An evolutionary model**

Dahlberg, T. - Hokkanen, P. - Newman, M. (2016) How Business Strategy and Changes to Business Strategy Impact the Role and the Tasks of CIOs: An Evolutionary Model. In: *49th Hawaii International Conference on System Sciences*, 1-11.

#### **4.1.1 Research objectives**

The first article concentrates on the factors that influence CIOs' work and whether the role and tasks of CIOs are defined in the same way regardless of industries. It is inherently clear that technology is an important factor in this definition, but are there any other similarly significant factors?

We first reviewed the literature, identifying what has been said about the CIO role, and found two classes of articles: CIO role studies and evolutionary studies. Citations to this literature are provided in the articles (articles 1-5). CIO role studies (e.g. Brown 1993; Gottschalk 2000; Peppard et al. 2011; Weill & Woerner 2013) examine a certain moment of time and give suggestions for the core competences or qualities that a CIO must have to be successful. The issue with these studies is that they age quickly because of the rapidly changing competences needed over time. This evolution is also evident in the study by Longenecker, Feinstein and Clark (2012) concerning IS curricula ranging from 1972 until 2012. Evolutionary studies (e.g. Rockart et al. 1982; Applegate & Elam 1992; Ross & Feeny 2001; Ricciardi & De Marco 2012) describe the changes over time, and these studies mainly conclude that the changes in the CIO role or the competences needed in an organisation are continuing. In this sense,



these descriptions endure time better than CIO role studies. However, we think that, in the evolutionary studies, it is also necessary to understand which factors explicate the change.

Under these circumstances, we challenged ourselves to find a model that could describe the factors determining CIOs' role and tasks. We selected Leavitt's model of applied organisational change (Leavitt 1965, 1145) from the alternative models because it is a general organisational diagnostic model and is still capable of describing the organisational evolution. However, we widened the concept by including contemporary wording in the factors as follows: *structure, business model and governance* instead of the original *structure; technology, ICT services and information* instead of *technology*; and *tasks and processes* instead of *tasks*.

To validate the updated Leavitt model, we used our data from thirty-six CIO interviews in six industries. These data were collected to understand the change in CIOs' tasks and role during the whole period of the respondent's work as a CIO. Most of the questions were twofold, asking how things were when the respondent started her/his job as a CIO or an equivalent position and how things are now, at the time of the interview. The questions ranged from the background of the respondent to the leadership, strategy and valuation of the IT function. In addition, the respondents were asked about changes over time and challenges currently and in the future in the organisation.

We also noticed that the researched literature findings from CIO role studies and evolutionary studies can be classified and understood using the Leavitt model's factors. We created four tables, one for each of the Leavitt model's factors, using the CIO literature as a basis. The roles proposed by the literature were then compared with the answers obtained from the interviews. In this article, we emphasise the business strategy factor and therefore do not report the other tables in our results.

#### **4.1.2 Findings**

First, our analysis of the interviews, evaluated against our updated Leavitt model, showed that the *technology, ICT services and information* factor was the most important for the role and tasks of a CIO. That was not a surprise. However, the analysis revealed that the factor *structure, business model and governance* was almost as important. The *people* and *tasks and processes* factors were significant determinants of CIOs' work but had less weight than the other two.

It is obvious that the tasks of CIOs have changed over the years according to both the literature and our empirical data. From the vast innovation of new technologies and the business models' impact on the tasks, it is clear that they will be redefined again later (e.g. Benjamin & Scott Morton 1986, 20; Henderson

& Venkatraman 1989; Carter, Grover & Bennet 2011). However, the description of the role of a CIO has remained unchanged. We found in the literature that, in the 1980s and 1990s, the role of a CIO was already defined as a strategic role; the CIO leads strategic technology in organisations in a business executive role (e.g. Rockart et al. 1982; Couger & Amoroso 1989). Contrarily, our empirical data show that 64% of our respondents reported that, during those past days, the CIO had no strategic role in organisations. The valuation of the role of a CIO has grown along with the changes in business strategies having defined technology as one of the most important business drivers in a company. This was also shown to be valid in our interview analysis.

Our assumption was that there are similarities within industries that impact how the CIOs of that industry perceive their role and tasks. It was a surprise to us that we could not find any clear industry specific similarities with the tasks of the CIOs.

We also found that Leavitt's applied organisational change model is a powerful framework in which to define the change factors in an organisation. Our improvements to its wording give a more contemporary meaning to the factors. The model shows how the factors are interrelated, and our case and CIO tasks and role demonstrate the validity of the model. We also propose that the model's factors define the boundaries for CIOs' role and tasks by means of change in the factors and their interrelation.

## **4.2 Article 2. How business strategy and technology impact the role and the tasks of CIOs: An evolutionary model**

Dahlberg, T. - Hokkanen, P. - Newman, M. (2016) How Business Strategy and Technology Impact the Role and the Tasks of CIOs: An Evolutionary Model. *International Journal of IT/Business Alignment and Governance*, Vol. 7 (1), 1-19.

### **4.2.1 Research objectives**

Our second article continues the work of the first article by using the Leavitt model as a framework theory and trying to understand whether it could serve as a useful description of the factors that shape a CIO's role and tasks within an organisation. We also wanted to deepen the understanding of the model's usability in business strategy change situations by asking: "Could the Leavitt model describe the changes to a CIO's role and tasks within an organisation that adapts to technology changes and transforms business with a new business strategy?"

Also in this study, we used the same broad literature research consisting of 35 CIO role studies and evolutionary studies written during the years 1980-2012 to create an understanding of what has already been said about CIOs' tasks and role in addition to our first article. From that research, we drew the conclusion that the everyday tasks of CIOs, reflecting changes in both technological understanding and strategy and business orientation, appear to evolve, increase and broaden over time, and that will most likely continue in the future. We also found that the CIO role description has been the same for years, even though the expectations of and the requirements for the work have increased heavily.

According to our previous results in the first article, the *technology, ICT services and information* factor and the *strategy, business model and governance* factor have almost the same importance in CIOs' tasks and role. We now propose that the Leavitt model is capable of explaining how technology affects the business strategy. We think that changes to these factors determine changes in the role and tasks of CIOs in relation to other model factors. The model contains the idea that, if one of the factors changes, it affects all the other factors in the model, and they will also change. All the relations between the model's factors are bidirectional. According to our results, it seems that, already now and in the near future, the connection between business strategy and especially new technology is tightening. Changes in these factors are intertwined in current businesses due to the pervasive power of Internet connectivity and its impacts on everyday life.

#### **4.2.2 Findings**

The main contribution of this study is that it strengthens the understanding of the Leavitt model's usefulness in describing the factors that determine the tasks and the role of CIOs in general and as a diagnosis of specific organisations at certain moments. We also propose that the modified Leavitt model describes how business strategy and technology as well as changes to them influence the role and tasks of the CIO in a bidirectional way.

The four factors of the Leavitt model are also useful for classifying the constantly evolving, increasing and diverse tasks of CIOs as well as the findings of earlier CIO research. We compiled summaries of findings classified by Technology Context and Business Strategy Context using the modified Leavitt model to show that visually.

### **4.3 Article 3. Understanding the changes in the role and the tasks of CIOs: An evolutionary boundary model**

Dahlberg, T. - Hokkanen, P. - Newman, M. - Hyvönen, H. (2017) Understanding the Changes in the Role and the Tasks of CIOs: An Evolutionary Boundary Model. *IAC Online Journal*, Vol. 1 (1), 6-26.

#### **4.3.1 Research objectives**

In our third article, we continued to investigate the changes in the role and the tasks of CIOs. First we introduced from the literature the CIO role studies describing CIOs' major roles in IT deployment and the evolutionary CIO studies often referring to the changes in the deployment of IT. As we see it, the evolution of IT, strategic management thinking and scope, needed skills and culture and new processes may lead both of these orientations to be outdated.

Therefore, we crafted the idea of a boundary model, which could stand the various time frames, management styles and competences, expanding use of IT in various ways and changes in the business environment and processes. We learned from our interviews with thirty-six CIOs that the tasks of some interviewees had changed significantly over time (*processes and tasks factor*). We also learned that the change in business operations or in the IT function's way of working was challenging when the CIO started her/his career (31% of respondents) and that the challenge has even grown (33% of respondents) (*structure, business model and governance factor*). Cooperation with business people was a major challenge for 25% of our respondents at the beginning of their career, and it still was for some of them (*people factor*). Rather few respondents (11%) thought that business skills were important in the early days in CIOs' competence portfolio, but 42% thought them to be important currently (*people factor*).

Next we classified the answers of the interviewees according to the factors of the Leavitt model and assessed the outcome against the literature. The result was presented in four tables according to the Leavitt model's factors. The outcome shows clearly the diversity of the tasks of CIOs both in the past and in the present. However, during the same time period, the description of a CIO's role did not change.

#### **4.3.2 Findings**

The main contribution of our research is the confirmation that the modified Leavitt model is able to describe the factors shaping and establishing the

boundaries for the tasks and the role of a CIO in an organisation regardless of the industry, organisational units, changing operational environments, evolving management practices or time frame. The Leavitt model can be seen as a framework extending beyond a certain lapse of time and a certain development stage of each factor. The model describes well the continuous growth of IT and CIO work, namely the expansion of their boundaries. It was also a suitable tool to categorize our empirical data and the earlier CIO studies in the literature.

The research also strengthened our earlier understanding of the importance of the *technology, ICT services and information* factor and the *structure, business model and governance* factor. Technology is the value factor that creates new business opportunities, and CIOs' work has a stronger business strategy focus than ever before. However, we found that only 31% of our respondents reported to the CEO directly and only 14% of our respondents were members of group-level executive committees. This might show the difference in perceptions of the strategic role of a CIO between CIOs themselves and CEOs.

Furthermore, in our study we could not find any clear impact of industries on CIOs' tasks and role. The study included six industries, within which there were no industry-related differences. The only exception was that in some industries merger and acquisition processes were part of business strategies – for example retail and media – and therefore those actions also took more time from CIOs. At the company level, the work areas and related tasks differed quite considerably. Due to the fact that almost all the companies included in our study are large companies according to the EU classification, we were not able to investigate the impact of the company size on the role and tasks of CIOs.

#### **4.4 Article 4. A longitudinal study on the perceived roles of IT and the corporate IT function with influences on CIOs' work equilibria in a media company**

Dahlberg, T. - Hokkanen, P. - Newman, M. (2017) A Longitudinal Study on the Perceived Roles of IT and the Corporate IT Function with Influences on CIOs' Work Equilibria in a Media Company. In: *50<sup>th</sup> Hawaii International Conference on System Sciences*, 5164-5173.

##### **4.4.1 Research objectives**

The fourth article is a continuation of our previous studies concerning the tasks and role of CIOs. In this research, we investigated the factors that have an impact on the equilibria of IT executives in their work. We wanted to understand better how the differences in perceptions regarding the roles of IT and the corporate IT

function influence the work of IT executives. We also aimed to identify the social mechanisms that contribute to the (dis)agreement on the roles of IT and the corporate function.

As a start, we introduced the framework of the strategic impact of IS activities on companies created by McFarlan, McKenney and Pyburn (1983, 150). This framework categorises companies into four groups (*factory*, *support*, *turnaround* and *strategic*) and then determines the role of IS activities according to the category. This framework is well known (see e.g. Coltman et al. 2015, 92), and we think that it still affects managerial thinking and attitudes even though the whole market environment, companies' strategies and the pervasive role of IT in current businesses have changed hugely.

For this study, we selected from our earlier CIO interviews one media corporation, in which mergers and acquisitions (M&A) had been negotiated frequently for several years. One of the CIOs interviewed earlier was still working as a CIO in this selected corporation, and another CIO interviewed earlier was in the position of IT manager in one of the corporation's business lines after an M&A transition.

We agreed to use the longitudinal case study methodology in this research, and we had the possibility to interview the CIO, all her direct employees – the IT manager being one of them – and her CFO supervisor. The questionnaire covered the years from 2010 to 2016 in the company. Due to good results from using a semi-structured questionnaire in earlier research, we agreed to use the same method again but to structure the questionnaire in such a way that the chronological order of the events was clear. This was important, because, in a case study, the timeline of events creates accuracy for the research.

For this interpretive research, we used the punctuated equilibrium model to describe how major business interruptions (i.e. punctuations) influence the work of employees and, in our case, the CIO and her inner circle. We also used Granovetter's (1973; 1983; 2005) social network theory constructs with the punctuated equilibrium model. With these constructs, we intended to deepen our understanding of the social factors and mechanisms affecting the changes in equilibria of work after interruptions.

#### **4.4.2 Findings**

We found that business interruptions unbalanced the work equilibria of our researched participants. Each of them aspired to reach the new equilibrium, because they experienced changes in some or all of the factors of the model depending on the work role. The supervisor of the CIO reached his new equilibrium quickly, for the IT manager it took more time and the CIO did not

reach the new equilibrium within the time frame that we studied. There were clear differences in the perceptions of the researched participants about the roles of centralised IT and the aspired-for equilibria of work.

We also found that Granovetter's (1973; 1983; 2005) social network constructs were highly applicable with the punctuated equilibrium model. Differences between norms (*core values and beliefs*) and other deep structural elements (*strategy, distribution of power, organisational structure and the organisation's control systems*) (e.g. Tushman & Romanelli 1985) of the social groups to which our researched participants belonged explain the differences in the abovementioned perceptions. The same differences in the deep structure and social groups also explain the differences in the social mechanisms used to share ideas and other resources. In addition, the density of ties between social groups, the structural hole construct and social embeddedness describing the economic and social nature of work helped us to understand how the differences emerged and why they were not overruled during the time period of our research.

#### **4.5 Article 5. A socio technical punctuated equilibrium model enhanced with social network theory: As the descriptor of changes in the equilibria of CIO work**

Dahlberg, T. - Hokkanen, P. - Newman, M. (2017) A Socio Technical Punctuated Equilibrium Model Enhanced with Social Network Theory: As the Descriptor of Changes in the Equilibria of CIO Work. *International Journal of IT/Business Alignment and Governance*, Vol. 8 (1), 1-16.

##### **4.5.1 Research objectives**

In this fifth article, we continued the work of the previous study, and the conference paper was refined as a journal article. The research questions remained mainly the same as in the fourth article, but we focused more on the socio-technical punctuated equilibrium model and the justification for its usability in interpretive research concerning IT executives' work.

We emphasised the rapid digitalisation of businesses and the change in the business world from the 1980s, when the use of IS was remarkably confined. In our media market case company, the product digitalisation and transformation to digitalised business defined the current status well. Despite the business digitalisation, the IT-business alignment thinking in our case company seemed to be in a position in which the roles of the business strategy and IT were separated. As a consequence, there were different and contradictory perceptions about the role of IT and especially the role of a centralised IT function.

According to our data, both in this case study and in the previous CIO interviews, CIOs balance the technology, structure, tasks and people factors continuously in their tasks. This is due to the expanding and contradictory expectations of business leaders and the constant change in these factors. During radical business interruptions, like major M&A transactions, this balance is disrupted.

As in earlier research, we enhanced the punctuated equilibrium model with Granovetter's (1973; 1983; 2005) social network constructs. These constructs were used to explain the differences in the perceptions of IT's and especially CIOs' and the centralised IT function's role within different social groups.

#### ***4.5.2 Findings***

In this longitudinal study of a media company, we used both the punctuated equilibrium model and the constructs of Granovetter's (1973; 1983; 2005) social network theory to understand the work equilibria of IT executives in major business interruptions. We interpreted and concretised the narratives of the respondents with a graphical picture. These graphs were discussed with the respondents to verify that we had understood the narrative as it was told. Each respondent had the possibility to comment on and modify her/his own graph and narrative. Following this method not only enhanced our own interpretation of the work equilibria but also created a shared interpretation of them with the respondents. Due to its concreteness, we think that this was an efficient way to reach a shared understanding. Therefore, we propose that the method could be used in studies examining the impact of punctuations on the work of individuals as social actors both in the academic world and with practitioners.

As this journal article is based on the conference paper introduced as article 4, the main findings of the study are the same as in that article.





## 5 FINDINGS

### 5.1 The research question

The research question of the thesis was

*Why are the tasks and the role of a CIO still not stable after all the years of the profession's existence, and how does this instability influence the tasks and the role of a CIO?*

The findings, according to our studies reported in the first three articles, are presented here classified within the Leavitt model's four factors and the reported importance of their impact on CIOs' tasks and role.

Table 2. Reported importance of factors influencing CIOs' tasks and role (see Dahlberg et al. 2016a, 4915)

|          | Technology,<br>ICT services,<br>information | Strategy,<br>business model,<br>governance | People | Tasks,<br>processes |
|----------|---|--|--------|---------------------|
| Weak     | 4   | 6  | 6      | 8                   |
| Mediocre | 10  | 11   | 19     | 12                  |
| Strong   | 22  | 19   | 11     | 13                  |
| Total    | 36  | 36   | 36     | 33                  |

#### **Technology, IT services and information**

First, the huge innovation of new technologies and their impact on companies' strategies, business models, processes and work roles are pervasive. Technology is also the most important factor for the tasks and role of a CIO. Twenty-two of the thirty-six interviewed CIOs emphasised this factor strongly in our analysis. Respondents told us that technology enables business, creates new opportunities for business or for new technology-enabled services, which can be launched into markets and thus the business is able to grow. This indicates that the digital transformation of businesses is on-going and changing the market in several industries.

### **Strategy, business model and governance**

The strategy, business model and governance factor was almost as important as the technology, IT services and information factor. Nineteen out of thirty-six respondents emphasised that factor strongly and eleven respondents reported it to be mediocre in our analysis. The valuation of the role of a CIO has grown along with the changes in business strategies that have defined technology as one of the most important business drivers in a company. While creating new business opportunities, technology has been used as a value-adding factor; thus, CIOs' work has had a stronger business strategy focus than ever before. It also indicates that digital business strategy as a fusion of business strategy and IT strategy is gradually taking place in organisations' strategy processes. In parallel with this development, a CIO's strategic role in companies is enhanced.

### **People**

The people factor was a significant determinant of CIOs' work but had lesser weight than the factors of technology and strategy. Eleven out of the thirty-six respondents focused their attention strongly on the people factor, and nineteen out of the thirty-six reported it to be mediocre. Of our interviewed CIOs, 64% told us that, in the early days of their career, CIOs did not have a strategic role in the organisations. We found that, even at the time of the interviews, only 31% of the respondents reported to CEOs directly and only 14% of the respondents were members of group-level executive committees. We thought that this might show the difference in perceptions of the strategic role of a CIO between CIOs and CEOs. However, these figures are challenged, for example by the research of Harvey Nash and KPMG conducted in 2016, according to which the amount of CIOs reporting directly to CEOs is growing yearly (Harvey Nash & KPMG 2016, 14).

Our research also shows the change in our respondents' perceptions of how well business managers understood IT in the past and present. During the early days the business managers had no IT education and 64% of our respondents thought that in the past business managers understood IT poorly or not at all. In contrast, 89% of respondents reported that business managers' current IT understanding is clearly better.

The interesting detail is that the CIO role description in the academic literature remained substantially the same during all the years since 1981, when it was used for the first time (e.g. Rockart et al. 1982; Ricciardi & DeMarco 2012). It was described as a strategic role bearing the main responsibility for information technology in an organisation. As shown, our data do not support this idea; instead, they show that the role has mainly been more operative throughout these years. However, both the academic literature and our study show clearly that the work area of a CIO has expanded enormously during these years.

We also found that there were clear differences in the perceptions of the researched participants about the role of a centralized IT function, including CIO work and the aspired-for equilibria of the work. That led us to our research's sub-question: "Why are the tasks and the role of a CIO perceived differently in different business areas in an organisation?"

### **Tasks and processes**

The tasks and processes factor was also a significant determinant of CIOs' work but had the least importance of the four factors. Only thirteen out of thirty-three respondents underlined it strongly, and twelve reported it to be mediocre. As already reported in our first article (Dahlberg et al. 2016a), the processes and tasks factor was not addressed directly by any of the questions in our questionnaire, and therefore the number of answers was lower than for the other factors. However, we found that many CIOs considered processes to be a natural part of their current work.

According to our empirical data as well as the researched literature, the tasks of a CIO have changed and expanded over the years. However, when comparing the tasks of CIOs across companies, they differed widely. Furthermore, we could not find any clear industry impact on the tasks, but, within those industries that perform a large number of mergers and acquisitions, CIOs were also involved in tasks needed in the acquisition phase.

### **The Leavitt model of applied organisational change**

As shown in the articles and from the findings presented here, we can justify the use of the Leavitt model of applied organisational change as a framework for studying the tasks and role of a CIO in organisations. It has shown its power to define the change factors in an organisation. It also describes how the factors are interrelated to each other. The research on CIOs' tasks and role demonstrates the validity of the model. It was useful in this research to classify the findings of both earlier CIO research and the current research.

## **5.2 The first sub-question**

Our first sub-question was "Why are the tasks and the role of a CIO perceived differently in different business areas in an organisation?"

After noticing that the tasks and role of a CIO are seen differently among the actors in an organisation, we wanted to understand the reason for this. Our approach was to investigate this phenomenon using a merger and acquisition case study among the organisations that were already present in the first data collection. We found that our researched participants belonged to different social

groups inside their organisation. Within these different social groups, there were differences between norms (core values and beliefs) and other deep structural elements, specifically strategy, the distribution of power, the organisational structure and the organisation's control systems (Tushman & Romanelli 1985, 173; Silva & Hirschheim 2007, 331). Due to these differences, the meaning of a CIO's role and tasks was viewed differently in different business areas. The same differences in deep structure and social groups also explained the differences in the social mechanisms used to share ideas and other resources.

We also noticed that merger and acquisition events caused interruptions in a business and unbalanced the work equilibria of some of our researched participants. Some of the participants were not affected at all, some reached their work equilibrium quite quickly and the participant in a CIO role did not reach the work equilibrium within the time frame of our research.

### **The punctuated equilibrium model**

We interpreted and concretised the narratives of the respondents with a graphical picture of their punctuated equilibrium within different time frames. These graphs were discussed with the respondents to verify that we had understood the narrative as it was told. Each respondent had the possibility to comment on and modify her/his own graph and narrative. With this method, we not only enhanced our own interpretation of the work equilibria but also created a shared interpretation of it with the respondents.

### **The social network theory constructs**

Granovetter's (1973; 1983; 2005) social network constructs were highly applicable with the punctuated equilibrium model. The density of ties between social groups, the structural hole construct and social embeddedness describing the economic and social nature of work helped us to understand how the differences emerged and why they were not overruled during the time period of our research.

## **5.3 The second sub-question**

Our second sub-question was "Would it be possible in general to find the boundaries for the tasks and role of a CIO?".

This sub-question arose during our studies of why the tasks and the role of a CIO have not stabilized. While studying the factors of the Leavitt model, we realised that the model's factors actually define the boundaries of CIOs' role and tasks in an organisation by means of change in the factors and their interrelation.

The modified Leavitt model is able to describe the factors shaping and establishing the boundaries of the tasks and the role of a CIO in an organisation regardless of the industry, organisational units, changing operational environments, evolving management practices or time frame. Furthermore, it describes well the continuous growth of IT usage and CIO work, namely the expansion of their boundaries.



## 6 DISCUSSION AND CONCLUSIONS

In this chapter, the results of this research are discussed. The research is also subject to limitations, and suggestions for further research are proposed. The results offer answers to both the scientific audience and the community of practice. We think that our results are credible, useful and contribute to current scientific as well as practical communities.

This thesis was written based on the researcher's view of the world, taking for granted that free will exists and that we as human beings do not behave as deterministic machines. Therefore, the absolute truth and accordingly generalizable universal findings cannot be found in this work, because only one truth simply does not exist; truth constantly evolves in our daily life. Even in positivist studies, the truth occasionally changes over time, and the flat world has been proven to be round. The stance of this study was not chosen just for liaisons of convenience, as Klein warned (Basden 2011, 487), but made this work even harder. However, we think that this work shows clearly how the credibility of an interpretive study has been enhanced with the use of the methods discussed earlier.

### 6.1 Theoretical contributions

First, our results clearly demonstrate that the modified Leavitt model endures over time and describes the factors influencing the role and tasks of a CIO in an organisation. It offers an efficient framework of interrelated factors for organisational change studies. In its original model, it left changes in the environment (cf. Scott 2003, 18) out of the scope, and within our work we followed the original model and only updated the wording to contemporary business language. Our justification for this solution was that the factors of *strategy, business model and governance* and *technology, IT services and information* actually take the environment factor into consideration inside the organisation. In their strategies, organisations have to take the external environment into account, and the evolving technology is evidently affected by global advancements.

We suggest that the way we studied the role and tasks of a CIO using the Leavitt model of applied organisational change is innovative. The Leavitt model was used as a theoretical lens by which the interviews of 36 CIOs were



analysed. The analysis revealed not only the reported importance of the order of the Leavitt's factors but also the change of an individual role during the time period investigated. Even though the model is developed for organisational change studies we demonstrated that it is also suited well to individual role change studies. First of all, CIOs are not just individuals with their own ideas about the role and the tasks of CIOs, but they are also the heads of a significant organisational unit, which has to serve all the other organisational units. Secondly, as I stated earlier in the methodological basis section, according to my understanding, organisations do not exist without the actors such as CIOs and others.

We also confirmed the usefulness of the punctuated equilibrium model with Granovetter's (1973; 1983; 2005) social network theory in organisational research. With this evolutionary model, the change and the pain points caused by a change in an organisation can be demonstrated. In our world view, the organisation is a construction that evolves through the social interactions among its social actors. Therefore, we need to understand that, in an organisation, there are different social groups acting in accordance with their own norms, which may differ from group to group. The punctuated equilibrium model with the social network theory used pinpoints these differences efficiently, as demonstrated in our articles four and five (Dahlberg et al. 2017b; 2017c).

In our case study we used the punctuated equilibrium model in a novel way. As reported earlier, we drew the graphical pictures of the respondents' narratives using the punctuated equilibrium model at three different points in time. Each of the three different timeframes showed the status of the equilibrium experienced by the respondent. Again, we used the organisational diagnosis model for researching an individual role of an organisation. We found that these graphical pictures were efficient tools to discuss and to create a shared understanding of the experienced work equilibria with the respondents.

We also want to emphasise the enhanced interactive multi-stage interview method used in the research work. We started with the interview model familiar to earlier research in which an interviewer asks the respondent questions and writes down and records the answers. Later on the researcher encodes the record, completes her/his notes and analyses the text. In this widely used method, the researcher has the undivided power of interpreting the answers, and the trustworthiness of the results may be challenged.

Facing the big ontological and epistemological struggle of accepting the positivist stance in research on social actors like CIOs and understanding that interpretive research has its credibility problems, we agreed to develop the interview method. We changed the interview action so that the respondent could see both the questions and her/his given answers all the time. The respondent had the possibility to correct her/his meanings immediately during the interview, and

we estimate that this not only gave credibility to the answers but also provided confidence between the parties. The respondent noticed that the researcher was not adding to or leaving out her/his interpretation of what was said but respecting her/his message. The only downside of this method is that the researcher has to be a good enough typist; otherwise, it cannot be used. However, typing mistakes did not ruin the interview situation; they were merely ignored by the respondent or sometimes they were laughed about by both parties, easing the atmosphere.

The next phase of creating narratives and graphical drawings in our case study and interpreting them with the respondents took the analysis phase to an enhanced level, thus adding credibility to the study. We highly recommend the use of this new enhanced interactive multi-stage interview and analysis method in this kind of study, providing trustworthiness of the methods in interpretive studies.

## 6.2 Practical contributions

The main contribution to the community of practice is the overall understanding of a CIO's role and tasks in an organisation. In the big picture, the CIO's role in an organisation is not stable, and it seems that it will not stabilise in the future either. According to our understanding, the main reason for this is the continuous change in an organisation due to changes in its four factors, *technology, IT services and information* being the most important and *strategy, business model and governance* being the second most important factor. Basically, the questions for executives and especially for a CEO ask what the most efficient division of work of an organisation is and who the most competent person to lead the technological evolution in the business is.

We claim that the strategic role of IT should be better understood by executives. As described in this research, IT interrelates with strategy, processes and people. If the business strategies and IT strategies are still separate in a company, the value creation potential of IT is lower. We advise executives to include the CIO of the organisation as well as the IT function to be active in the strategy process if that is not the case already. Furthermore, the digital business strategy (Bharadwaj et al. 2013) discussed earlier, could be a way to enhance the business potential.

As found in our research, the organisation has different views about CIOs' role and tasks according to the respondents' own role. In our work, we created a graphical presentation of the unbalanced work equilibria for three roles of an organisation within three different time frames. We found that the graphical presentations were powerful tools to create a shared understanding of the issues in an organisation hindering cooperation. We think that this tool could be used in organisations' diagnostic studies seeking internal efficiency.

We also suggest that practitioners should pay attention to the work equilibria and the social networks in the context of major business interruptions, such as strategy changes. The expectations and attitudes of actors in an organisation towards other business units are affected by cultural norms of their own social groups and are often unconscious and contradictory. Also the ideal equilibrium is not the same for every person in an organisation.

According to our research, CIOs are under pressure due to constant changes in their work. This is also verified from the other CIO studies (see e.g. Peppard et al. 2011). Current CIOs cooperate with all business units and support functions in an organisation and they face conflicting demands and perceptions about IT with too few tools to cope with these demands.

### **6.3 Research limitations**

First, the methodological issue in this work is that, if we had taken the Leavitt model into use as an initial guide (Walsham 1995, 76) before drafting the questionnaire and research questions, the questionnaire would probably have been more balanced with the Leavitt factors. In this research, the factor of tasks and processes received less attention in the questionnaire. However, the skills needed then and now were emphasised, and the factor was not left without recognition.

The other limitation is that the empirical data were collected only in one Western country and from six mainly large organisations in different industries with two exceptions. We did not collect data from the SME sector and the findings may have been different if SME organisations had been involved. On the other hand, there are few CIOs in small companies.

Undertaking the case study in only one organisation can be considered to be another limitation. The data would have been richer if there had been another case organisation. However, finding a similar organisational setting after a merger and acquisition phase in an organisation among the thirty-six interviewed CIOs was an issue.

As a potential limitation, Leavitt's model is an organisational level model, whereas my unit of research is an individual. However and as explained earlier, my interpretation is that CIOs have a prominent role in leading an IT unit and serving all the other organisational units. Furthermore, organisations do not exist without actors such as CIOs and other individuals. In summary, my opinion is that due to these reasons organisational development models are well suited to investigations about the role and tasks of CIOs.

## 6.4 Further research

We see several topics for further research. First, a separate method paper regarding the enhanced interactive multi-stage method of interviews and analysis of interpretive studies would be worth writing. Even though there are already research papers on interviews, we have not seen this kind of method paper used or described earlier.

An interesting question considering the SME sector concerns how far a business can grow without internal IT skills. A study in selected industries of firms that do not have a CIO or even an IT manager could be of special interest to small companies.

A further research area involves what the interviewed CIOs are working on currently, how many of them are still working as a CIO and how many have changed their position, company or industry. This kind of a study could give us more insights into the persistence of CIO positions as well as showing the direction of the change.

A study researching the division of work and the new or optional titles for CIOs, such as CDO, COO or CTO, could provide a better understanding of the needs in contemporary organisations. The key question is, who is responsible for the digitalisation of a company? Why is this kind of an evolution taking place, and does it enhance the efficiency of the organisation?

In my thesis I compared the IT function with the other functions in a company and explained that IT function differs from finance and HR functions especially because in IT there are very few global or regional established rules or legislation which have to be followed. Therefore, the studies concerning IT governance as part of the corporate governance and CIO work could be researched further.

A thorough literature study of evolutionary models in organisational research could also be useful for scientific audiences. With that research, the understanding of their quality and suitability for different research settings could be assessed.



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## APPENDICES

**Appendix 1:** Characteristics of the respondents in the first data set

**Appendix 2:** Interview form of the first data set

**Appendix 3:** Classification of responses

**Appendix 4:** Characteristics of the respondents in the second data set

**Appendix 5:** Interview form of the second data set





## Appendix 1: Characteristics of the respondents in the first data set

| Sector               | Date     | Timeframe of the answers, then - now | Years acting as CIO | Gender                     | Age Group | Size of the company (revenue) |
|----------------------|----------|--------------------------------------|---------------------|----------------------------|-----------|-------------------------------|
| <b>Media</b>         |          | <b>average:</b>                      | <b>8</b>            | <b>3 Males, 2 Females</b>  |           |                               |
| CIO1                 | 09/03/11 | 2005 - 2011                          | 6                   | Female                     | 50-59     | Large <500me                  |
| CIO2                 | 26/06/12 | 2000 - 2012                          | 2                   | Male                       | 30-39     | Large <500me                  |
| CIO3                 | 21/06/12 | 1997 - 2012                          | 15                  | Male                       | 50-59     | Large <500me                  |
| CIO4                 | 07/08/12 | 2001 - 2012                          | 11                  | Female                     | 50-59     | Large >1000me                 |
| CIO5                 | 13/10/11 | 2005 - 2011                          | 6                   | Male                       | 30-39     | Large <100me                  |
| <b>Public sector</b> |          | <b>average:</b>                      | <b>14.8</b>         | <b>5 Males, no Females</b> |           |                               |
| CIO6                 | 01/08/12 | 2006 - 2012                          | 6                   | Male                       | 50-59     | Large >1000me                 |
| CIO7                 | 24/10/11 | 1984 - 2011                          | 27                  | Male                       | 50-59     | Large <500me                  |
| CIO8                 | 27/07/12 | 1995 - 2012                          | 17                  | Male                       | 50-59     | Large >5000me                 |
| CIO9                 | 29/06/12 | 2008 - 2012                          | 4                   | Male                       | 50-59     | Medium <50me                  |
| CIO10                | 12/09/12 | 1992 - 2012                          | 20                  | Male                       | 50-59     | Large >500me                  |
| <b>Finance</b>       |          | <b>average:</b>                      | <b>10.75</b>        | <b>4 Males, no Females</b> |           |                               |
| CIO11                | 14/11/11 | 1999 - 2011                          | 13                  | Male                       | 40-49     | Large >1000me                 |
| CIO12                | 26/06/12 | 1992 - 2012                          | 12                  | Male                       | 50-59     | Large >5000me                 |
| CIO13                | 25/06/12 | 1996 - 2012                          | 1                   | Male                       | 50-59     | Large <1000me                 |
| CIO14                | 12/06/13 | 1987 - 2009                          | 17                  | Male                       | 50-59     | Large <500me                  |
| <b>Manufacturing</b> |          | <b>average:</b>                      | <b>10.55</b>        | <b>9 Males, 1 Female</b>   |           |                               |
| CIO15                | 25/10/11 | 1980 - 2011                          | 22                  | Male                       | 50-59     | Large >1000me                 |
| CIO16                | 18/10/11 | 1987 - 2011                          | 21                  | Male                       | 50-59     | Large >1000me                 |
| CIO17                | 29/06/12 | 2006 - 2012                          | 7                   | Male                       | 40-49     | Large >1000me                 |
| CIO18                | 14/10/11 | 2003 - 2011                          | 8                   | Male                       | 60-69     | Large >1000me                 |
| CIO19                | 16/11/11 | 1999 - 2008                          | 9                   | Male                       | 50-59     | Large >5000me                 |
| CIO20                | 15/06/12 | 2010 - 2012                          | 2,5                 | Female                     | 40-49     | Large >5000me                 |
| CIO21                | 14/08/12 | 2000 - 2012                          | 4                   | Male                       | 40-49     | Large >1000me                 |
| CIO22                | 28/11/13 | 1976 - 2000                          | 15                  | Male                       | >70       | Large >1000me                 |
| CIO23                | 28/06/12 | 2008 - 2012                          | 4                   | Male                       | 50-59     | Large >1000me                 |
| CIO24                | 06/03/09 | 1995 - 2008                          | 13                  | Male                       | 40-49     | Large >1000me                 |
| <b>Retail</b>        |          | <b>average:</b>                      | <b>14.63</b>        | <b>8 Males, no Females</b> |           |                               |
| CIO25                | 25/06/13 | 1988 - 2005                          | 17                  | Male                       | >70       | Large >5000me                 |
| CIO26                | 30/08/07 | 2005 - 2007                          | 7                   | Male                       | 40-49     | Large >5000me                 |
| CIO27                | 10/10/07 | 1998 - 2007                          | 9                   | Male                       | 50-59     | Large >5000me                 |
| CIO28                | 07/08/07 | 1999 - 2007                          | 8                   | Male                       | 40-49     | Large <500me                  |
| CIO29                | 26/09/11 | 1999 - 2011                          | 13                  | Male                       | 50-59     | Large <500me                  |
| CIO30                | 25/06/12 | 2000 - 2012                          | 12                  | Male                       | 50-59     | Large <500me                  |
| CIO31                | 04/07/12 | 1989 - 2012                          | 26                  | Male                       | 50-59     | Large <500me                  |
| CIO32                | 26/10/06 | 1956 - 1981                          | 25                  | Male                       | >70       | Large >1000me                 |
| <b>Services</b>      |          | <b>average:</b>                      | <b>14.75</b>        | <b>3 Males, 1 Female</b>   |           |                               |
| CIO33                | 18/06/12 | 1996 - 2012                          | 14                  | Male                       | 30-39     | Large >1000me                 |
| CIO34                | 18/06/12 | 1994 - 2012                          | 17                  | Male                       | 50-59     | Medium                        |
| CIO35                | 03/07/12 | 2002 - 2012                          | 10                  | Male                       | 40-49     | Large >1000me                 |
| CIO36                | 10/08/07 | 1991 - 2009                          | 18                  | Female                     | 40-49     | Large >1000me                 |
| <b>Summary</b>       |          | <b>average:</b>                      | <b>12.25</b>        |                            |           |                               |

## Appendix 2: Interview form of the first data set

Päivi Hokkanen

QUESTIONNAIRE

Page 1(2)

14.1.2012

**Name**

**Date and Place of an interview**

**Company, KPI's: personnel amount, revenue, profit**

### Background (time span 10 years)

1. What is your education and how long you have been working in ICT field?
2. In which years you led ICT department?/ From which year you have been leading ICT department?
3. How many years you have been working as a CIO/ ICT manager?
4. How many employees you had when your work started/ now?
5. In which role is your superior (CEO, CFO, some else)?
6. How has your organisation changed during the time you have been a CIO?
7. Why has it changed?

### II Framework of leadership

8. Which were the biggest challenges in ICT function when you started?
9. Your challenges now?
10. What kind of competences was needed?
11. Competence needs now?
12. What was the top management's understanding of the need of ICT then / now?
13. How would you describe a good leader?
14. What kind of steering groups there were and how they dealt with the ICT matters?
15. What kind of steering groups there are now?

### III Strategy questions

16. What is your company's strategy as of today?
17. Was the ICT department able to handle strategy changes?
18. How is it now?
19. Was the company's management able to handle strategy changes?
20. Was ICT department taking part of strategy work / is it now?
21. If it is, how?
22. Did you made an ICT strategy then / do you now do it?
23. What kind of KPI's were used / are used now?
24. Did ICT support effectively company's targets?
25. Does it now?
26. How technology's change affects to your company's strategy?

#### **IV Valuation**

27. How the ICT department was valued then?
28. How it is valued now?
29. How would you estimate the ICT savvyness (understanding of ICT) among business leaders then?
30. And now?
31. What kind of a role and responsibility was given to CT department then?
32. And now?
33. Was the CIO also a representative of top management then?
34. And now?
35. Was CIO nominated to groups steering group?
36. And now?
37. Did top management understand ICT's connection to productivity growth?
38. And now?
39. Did top management understand ICT's connection to revenue building?
40. And now?

#### **V Changes in time and place**

41. Has your company had noteworthy/remarkable M&A's or divestments in your time?
42. ICT's outsourcing?
43. How do you manage your network inside your company and with stakeholders?
44. What was your company's economical situation then?
45. And now?
46. How these changes have affected to ICT department?

#### **VI Challenges now and in the future**

47. Your company's biggest challenges now?
48. Your biggest challenges in CIO's role now?
49. What tasks belonged earlier to your work? And now? And in the future?
50. How are you involved with leading the business?
51. How are you involved with leading business ICT?
52. What is your outlook to the future?

- **Do you allow your name to be published?**
- **Are you willing to be interviewed again?**

### Appendix 3: Classification of responses

|                      | S&B<br>M&<br>G | statement   | PE | statement  | TE | statement   | T&P | statement  |
|----------------------|----------------|---|----|--|----|---|-----|--|
| <b>Media sector</b>  |                |   |    |  |    |   |     |  |
| CIO1                 | W              | Traditional "growing the business", several M&A's done, digitalisation not seen affecting to strategy yet.  | W  | ICT 's role is a service provider for business functions. Business units wanted to posit ICT department as development organisation. CIO is not involved to group's steering group.      | W  | Legacy systems should be renewed, "who owns the systems?"   | M   | "Who is responsible for developing processes, can they be outsourced to ICT-department?", "In ICT we always have to think through processes, business does not do that". |
| CIO2                 | S              | New strategy with four angles; win certain markets, offer digital products, challenge eCom players, create synergies within the Group companies.  | M  | Organisation structure and governance were open, co-operation with other group companies were built. CIO is not involved in company's steering group.                                    | S  | Creation of digital products and ecommerce are emphasised in the strategy.  | W   | Whole organisation under huge pressure and corporate level big changes affected to company's functions. Unstable.  |
| CIO3                 | S              | Being a market leader in digital services within a consumer group aged from 10 to 44. Big challenges for ICT since the development has been so fast. Market value chain has already changed.  | M  | Lean organisation, CIO involved in the strategy process and in company's steering group, but not in Group's. "We do not discuss the costs but how to develop this business".             | S  | Company's services are technology based multi channel services, new distribution channels and consumer devices appear all the time.     | M   | The meaning and cost effectiveness of processes have been noticed now internally. Half of CIO's time is spent with deploying process and project understanding.          |
| CIO4                 | S              | Digitalisation and reducing print media force to act. Huge, 120 degrees change in leading philosophy needed, one example is that in 2010 journalists wanted to publish their stories only in paper, not in untrusted web. From internal competition to shared services. | M  | The "local for local" thinking and acting preventing common targets. People understood that business will shrink and were scared to loose their jobs. CIO created and led the ICT board. | S  | Pressure from print media to electronic media was huge and shared services creation starting from data centers were under construction. | M   | In local company level processes were pretty well established but in corporate level very weak and those were not clearly supported from board.                          |
| CIO5                 | M              | To get more market share, top of mind brand, to find new revenue streams.   | M  | CIO is involved in strategy process and in company's steering group but not in Group's steering group.   | M  | Application renewal projects going on, usability development, analytics and search engine optimisation as a growing area.               | W   | Not mentioned at all. Cost control as one of the raised issues.  |
| <b>Public sector</b> |                |   |    |  |    |   |     |  |
| CIO6                 | M              | Strategy is merely as declared programme, service structures should be done, but implementation not started, though.  | M  | CIO thinks to belong to executives but is not sitting in the steering group.   | S  | Big changes can be done with technology, ICT showing the road for business. E.g. portal for proposed legislation.                       | M   | Process and service understanding capabilities needed.   |
| CIO7                 | S              | Productivity, customer care and customer safety as an emphasis. ICT strategy is based on customer care strategy, electronic services to be created.   | S  | ICT is involved in strategy process. CIO is involved in X's steering group.  | S  | Organisation is dependent on ICT. Central applications have been developed and shared registers as well.                                | S   | X has very strong processes covering the whole health care.  |

|                      |   |  |   |   |   |  |     |  |
|----------------------|---|--|---|---|---|--|-----|--|
| CIO8                 | S | Best public services with high quality, locally and easily.  | M | CIO is not involved to company's steering group.  | S | 24/7 services with high SLA's required. Emphasis changed from internal services to citizen services. Requires strategic agility. Technology has a very big role.                                     | S   | X is very process driven in their IT, service availability metrics is followed and the efficiency of the whole X is counted according to its services. |
| CIO9                 | W | Trustworth [...] ability.  | W | Strong change resistance in organisation, also at higher levels. CIO was creating information strategy, but it was not handled upper in the organisation. CIO does not feel to be as a top executive and is not involved in steering group. | W | Centralization of ICT, new work division. "Technology X-function is not needed in the country", says the higher officer.   | S   | Big changes in business processes and also in ICT processes.   |
| CIO10                | S | X strategy exists and ICT project portfolio is bound to that. ICT works as a strategic partner, this is written in X's policies.                           | M | CIO takes part of the strategy creation, feels like being top executive but not a member in city's steering committee.  | S | E-services development such as e-receipt, web services to citizens, social media strategy and data security.   | N/A | not discussed  |
| <b>Finance</b>       |   |  |   |   |   |  |     |  |
| CIO11                | M | Group strategy and business strategies are different matters which is an issue. "Traditional group vs functions -case".                                    | W | CIO takes part to development steering group, ut feels that he is not in executive group. "Cannot decide by ourselves" -issues. "Projects take too long and cost too much" -attitude.   | S | More than 1000 applications, huge complexity, enterprise architecture development in central role.   | W   | Not mentioned, eventhough in X those are pretty well established and controlled.   |
| CIO12                | S | From local to global 24/7.   | M | "ICT leader is selected based on the leadership skills and desire to develop business". CIO is involved in company's steering group.  | S | ICT is integrated heavily to business, it creates added value. ICT is part of strategy process and business all the time. Technology's impact on business is huge both in positive and negative way. | M   | Deciding processes and strategy process were mentioned, eventhough processes have to be established.   |
| CIO13                | M | Growth and internalization profitably. Company's ownership is sought to change.  | S | CIO is involved in company's strategy process. CIO is involved in company's steering group, sees himself as a top executive.  | S | Services to customers, multi currency capability, implementing new operating models. Mobile technologies and new payment methods implementation emphasis, from cards to digitalised services.        | N/A | not discussed  |
| CIO14                | S | In 1987 business was ahead of its competitors and ICT's role was to support production, 2009: strong business strategy including automation.               | S | CIO is part of the senior management and CIO feels like being a one. CIO is a member of the group's steering group.   | S | In the 1980s business was created on technology, later on technology has not have that strong a position.  | M   | CIO was responsible for invoicing processes.   |
| <b>Manufacturing</b> |   |  |   |   |   |  |     |  |
| CIO15                | S | 50/60/60 describing from where the revenue streams should come. "ICT is taking part of strategy work and cannot escape from it". Future looks challenging. | S | CIO's challenges are the same as company's challenges. CIO is involved in Group's steering group.   | S | ICT is a business enabler and service provider, whole ICT is changed including technology, services and business processes.  | S   | All business processes and services are changed.   |
| CIO16                | S | Strong growth and business development, frequent M&A's, ICT is a process owner of strategy facilitation.   | S | CIO takes part of strategy work, no separate IT strategies, CIO is involved in Group steering group.  | M | From legacy systems to shared ones, ICT acts like business enablers.   | S   | ICT takes part of process work, ICT needs to understand how information processes work, act as a strategy process facilitator.                         |

|       |   |   |   |   |   |   |   |  |
|-------|---|---|---|---|---|---|---|--|
| CIO17 | M | Shareholders profit maximisation which is ensured by profitable growth.   | M | CIO reports to Group CIO. CIO involved in strategy work and feels being a top executive.  | S | Strong growth via M&A's creates pressures to integration and change management. Enterprise architecture and business flows need to be managed. ICT enables scalable and efficient production. Process automation and technology products enabled. | S | Company level processes seen as one of the factors creating more efficiency and growth. Master data management through processes.  |
| CIO18 | M | Global footprint, goal is to be number one in this service business.  | W | ICT not involved in strategy work, CIO doesn't feel like being top executives, not involved in Group steering group.  | M | Several M&A's, a lot of duplicate applications. ICT needs to understand the change from technology oriented function to service oriented function. Group level architecture management has its lacks.   | W | Focus on ICT, not much on processes.   |
| CIO19 | S | [...] strategies, big M&A's done, spreading to Russia, ICT is a part of strategy function.  | M | New responsibilities: innovation domain given to CIO, still not in company's steering group.  | M | Due to M&A's huge infraprojects, application integration and data security as a main focus.   | S | Strong process point of view in ICT, process development emphasis during 2008-2010.  |
| CIO20 | S | Global harmonisation requires global IT and global processes.   | M | IT is not able to act as a driver, CIO is not involved in company's steering group.   | S | Global harmonisation is a main mission, business enabler, technology based R&D separated from ICT department.   | S | Emphasis in global processes, very important.  |
| CIO21 | S | "We know in real time, how millions of X devices and machine tools perform", ICT is involved in strategy process giving the input what could be done with the technology. | S | People challenges, how to develop a service function. CIO is a member of company's steering group.  | S | Global applications under construction, big transformation phase going on, technology enablers are driving company strategies.  | S | "In ICT we have developed also own competence area such as process competences and ICT takes more role and responsibilities of processes." Competence development and business model development are coming closer each other. |
| CIO22 | S | Globalisation and quick and strong growth.  | S | CEO was leading IT steering group until it started to work without his assistance. CIO was part of top management and was involved in company's steering group. | S | ICT is a business enabler and accepted as a part of business. Globalisation, open network, data security and data management as main focus areas.   | S | Processes alignment was done first and after than global implementation.   |
| CIO23 | W | Company has been profitable for a long time, ICT's contribution to business strategies is minimal, merely reactive.   | W | "ICT is a support function, does not need to be anything else." CIO is not involved to company's steering group.  | M | Cloud, mobility and connectivity mentioned couple of times, but those do not seem to have active role in company. Even though connectivity has to have.   | M | Life as usual, no changes to come.   |
| CIO24 | M | Profitable growth. Expanding to new markets in Russia and Europe.   | M | Authoritative leadership model. CIO was CEO in ICT company but not involved in Group's steering group.  | M | Flexible infrastructure and scalability, but restricted into Finland. That caused troubles in expanding new countries.  | W | A lot of M&A's but not a visible process in integration.   |

| Retail |   |  |   |   |   |  |   |  |
|--------|---|--|---|---|---|--|---|--|
| CIO25  | S | Creating new business areas and internalization. CEO emphasised the importance of ICT systems and therefore CIO was thoroughly involved. ICT did the visio- and vertical strategy model and business adopted it.   | S | CIO led ICT board above which there wasn't anybody to discuss or decide ICT matters, afterwards ICT matters were discussed in chain board. CIO was not involved in group's steering group, though.  | S | The chain business model and customer ownership model had not been developed without technology. Main focus in ICT was to work close with business partners.   | M | Horizontal and vertical strategies as well as chain model were implemented and CIO had a remarkable role in that.                                    |
| CIO26  | M | To offer remarkable benefits and services to customer owners. Business was started to grow to Baltic and Russia. Huge market grow.   | M | Very positive economic development affected to attitudes, "our way to do business" - thinking strong. Strategy discussions with CIO held, but CIO is not involved in group steering group.  | M | Chain business model applied also to ICT, M&A's easily done in ICT due to that.  | S | Processes described and documented, chain model applied. Long value chains have owners, ICT process owned by CIO.                                    |
| CIO27  | S | At first rigid and huge ICT department was outsourced to a supplier and a sub-company was created to offer services to new industry functions. After 3 years sub-company's business was closed down because of new chain model strategy. Huge structural changes in a big corporate. | M | CIO was acting as a CEO during the sub-company time. After that as a CIO at Group level and involved in chain strategy development. "CIO should understand the corporate structure issues and how they affect to applications and corporate's processes." CIO not involved to corporate's steering group. | S | Sub-company created its own selling systems to whole corporate which homogenised the whole business. That was align with the business strategy. ICT has always been important to corporate. After sub-company's closed down ICT service model wanted to be implemented through chains. | S | Processes were mentioned every now and then and CIO was well aware of those and the development.   |
| CIO28  | W | Company was in crisis in 99-2001, big strategic changes in operationing models and services started to be done and implemented (which did not affect too much to IS). Seeking growth and quality.  | M | CIO was involved in company's steering group, but not in Group's. CIO took part of company's strategy creation. CIO feels like being top executives. CIO's role was at first as a fire fighter. IT has always been important to the company.  | M | Ecommerce was started in late 1990s, and then developed further along time. Big data, dataware houses and reporting were developed. Stabilising infra and applications.  | W | Not mentioned  |
| CIO29  | S | "In our steering group there are only [...] sellers who have their own responsibilities, in my case IT."   | M | In internal discourse, CIO is part of the senior management and CIO feels like being a one. However, CIO is not taking part of the group's steering group (takes part of company's steering group, though).   | M | IT is part of core business, e.g. electronic [...] products. However, very low volume and no real impact on business yet.  | M | Processes need to be in shape and cost effective.  |
| CIO30  | S | Best concept, best customer experience and best location; new business partners using company's facilities.  | S | CIO was responsible for strategy process leading. CIO develops business with business leaders. CIO sees himself as a top executive, but is not involved in Group's steering group.  | S | New selling system which enables strategy changes both at customer experience and concept level. Electronic products and services enabled differentiation strategies.  | M | Cost control, always has been obligatory to save money. "ICT works more efficiently, information management from processes end-to-end is important." |
| CIO31  | W | To grow a remarkable X within five years and expand to new countries.  | W | "Still ICT has not seen as important to be involved in company's steering group". Cost control crucial. CIO not involved in company's strategy process.   | W | Replacing ERP system, new countries and new product areas are taken into account. Network connections to distant places and videoconference tools remarked as new technology. Ecommerce deployed in 11/2011.   | W | Company is changing its processes and turning them to work like in the other company in a Group.   |



|                 |           |  |           |   |           |  |            |   |
|-----------------|-----------|--|-----------|---|-----------|--|------------|---|
| CIO32           | M         | In 1970s, it was started to discuss strategies at company level, Porters lessons were used. However, several acquisitions were made and business in other countries started. | S         | Patriarchal people business, people were in central role, e.g. unique own health care, people did not want to change their work place. IT manager hold his position 25 years.   | S         | Strong compared to the time, one of the first computers in Finland, all applications were made from scratch.   | W          | Process understanding was not emphasised at the time.   |
| <b>Services</b> |           |  |           |   |           |  |            |   |
| CIO33           | M         | Operator of material and information streams, working around BalticSea.  | M         | CIO is involved in Group's larger steering group, not in the executives' steering group. CIO takes part of company's strategy process.  | S         | Company is a service company and ICT has a critical role. The whole company's service platform is based on ICT.  | M          | ICT takes part of M&A processes and strategy processes.   |
| CIO34           | W         | During the time of interview the company was on sale.  | S         | Change management is important, attitudes need to get changed. ICT is involved in strategy work already in process's early phases. "Has ICT anything to give within those early phases?" CIO is involved in Group's steering group. | W         | ICT should be a service provider, no value <i>an sich</i> . ICT is the function who writes down the business requirements and implement those.         | N/A        | not discussed   |
| CIO35           | S         | "Designed for you" business, certain selected geographical areas, cost pressure.   | M         | CIO thinks not to be a top executive, CIO is not involved in group's steering group, but is involved in process- and ICT-steering groups.   | S         | Integrations internally done, global ERP. Mobility very important, also in SOME, BYOD taken into use, clouds in areas which are not business critical. | S          | Processes in central role in the whole organisation currently, also steering groups are formulated according to processes |
| CIO36           | M         | A state function prepared to be a company and ICT systems especially for company's customer were classified as top priority issues.  | M         | CIO is in this year joining to group level strategy work. CIO reports to CEO and takes part of company's steering group but not in group's steering group.  | M         | E-business strategy enabled to create e-infrastructure.  | M          | Project work emphasised, ICT department works as a coordinator, no big changes done.                                      |
| <b>W:</b>       | <b>6</b>  |  | <b>6</b>  |   | <b>4</b>  |  | <b>8</b>   |   |
| <b>M:</b>       | <b>11</b> |  | <b>19</b> |   | <b>10</b> |  | <b>12</b>  |   |
| <b>S:</b>       | <b>19</b> |  | <b>11</b> |   | <b>22</b> |  | <b>13</b>  |   |
|                 | <b>36</b> |  | <b>36</b> |   | <b>36</b> |  | <b>33</b>  |   |
|                 |           | <b>Column heading meanings:</b>  |           | <b>Value abbreviations:</b>   |           |  |            | <b>3</b> who did not discuss processes at all   |
|                 |           | S&BM&G=STRATEGY, BUSINESS MODEL, GOVERNANCE  |           | S=STRONG  |           |  |            |   |
|                 |           | PE=PEOPLE  |           | M=MEDIOCRE  |           |  |            |   |
|                 |           | TE=TECHNOLOGY  |           | W=WEAK  |           | <b>Total number of evaluated factors</b>   | <b>144</b> |   |
|                 |           | T&P=TASKS AND PROCESSES  |           |   |           | <b>Consensus was done for</b>  | <b>16</b>  | <b>evaluations</b>  |
|                 |           |  |           |   |           |  | <b>11%</b> |   |

As agreed with the respondents, their names and companies are not reported. The statements are changed so that the respondents name and the company cannot be identified.

#### Appendix 4: Characteristics of the respondents in the second data set

| <b>Dates</b>                 | <b>Place of the interview</b> | <b>Interviewed</b>   | <b>Boss</b> | <b>Work unit</b> |
|------------------------------|-------------------------------|--|-------------|------------------|
| 3/2015,<br>3/2016            | Interviewee's office          | IT manager of bookstore, initial interview and feedback of narrative | CIO         | Bookstore unit   |
| 4/2015,<br>8/2015,<br>3/2016 | Interviewee's office          | CIO, initial interview, facts checked and feedback of narrative      | CFO         | Group            |
| 6/2015                       | Interviewee's office          | Logistics manager, initial interview                                 | CIO         | Group            |
| 7/2015                       | Interviewee's office          | IT service manager, initial interview                                | CIO         | Group            |
| 7/2015                       | Via video conference tool     | IT programme manager, initial interview                              | CIO         | Group            |
| 7/2015                       | Interviewee's office          | IT manager of literature and learning, initial interview             | CIO         | Literature unit  |
| 8/2015,<br>3/2016            | Interviewee's office          | CFO, initial interview and feedback of narrative                     | CEO         | Group            |
| 8/2015                       | Interviewee's office          | IT manager of media, initial interview                               | CIO         | Media unit       |

## Appendix 5: Interview form of the second data set

**Päivi Hokkanen**

**QUESTIONNAIRE**

**Page 90(2)**

**22.2.2015**

Interviewee's name:

Date:

### **I Background**

1. How long you have been in your current position and what is your title?
2. In which year did you start your ICT career?
3. How long you have been working in the Group?
4. Who is your boss (title)?

### **II Description of the organisation (chronological order):**

5. Organisation structure and size before the change in 2010:
  - a. Business structure:
  - b. ICT-organisation:
6. Organisation structure and size after the change in 2011:
  - a. Business structure:
  - b. ICT-organisation:
7. Organisation structure and size one year after the change in 2012:
  - a. Business structure:
  - b. ICT-organisation:
8. Organisation structure and size during years 2013-2015:
  - a. Business structure:
  - b. ICT-organisation:

### **II Strategic change in the organisation:**

9. When did the strategic change (e.g. M&A) occur?
10. Did you start to integrate ICT after the strategic change/M&A?
11. Did you leave some parts outside of the strategic change/M&A in ICT?
12. If so, why?
13. How long did the integration work/work in ICT due to strategic change take?
14. How it succeeded (schedule, costs)? Benefits?
15. Has the strategic change caused changes also in responsibilities?
16. Has the strategic change caused other unexpected changes in business (negative and positive)?
17. If so, what kind of changes?

## II Change impacts on the organisation:

18. How did the strategic change impact the organization:
  - a. Business volume growth?
  - b. Increasing profits?
  - c. New business areas?
  - d. On strategy; Other strategy changes?
  - e. On people, stakeholders?
  - f. On processes and tasks?
  - g. On technology?
  - h. Others?
  
19. How did the strategic change impact the ICT-organisation:
  - a. ICT-organisation's position in the company?
  - b. How the ICT-organisation is valued within the company?
  - c. What kind of metrics are you using?
  - d. New roles created?
  - e. Decreased headcounts?
  - f. New competences?
  - g. New tasks/processes?
  - h. New technology?
  - i. Outsourcing?
  - j. People networks?
  - k. New possibilities?
  - l. Challenges?
  - m. Other?
  
20. How has the change impacted on (you as) CIOs/ manager's
  - a. work?
  - b. role?
  - c. status?

## III Challenges now and in the future:

21. The biggest challenges in your company
  - a. now
  - b. after  
the strategic change?
22. Your biggest challenges as a CIO/manager now and after the strategic change?
23. Which tasks your work included before and after the strategic change (any differences)?
24. Are you involved in the business executives' board?
25. Are you involved in leading business ICT and how?
26. How does the future look like?

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