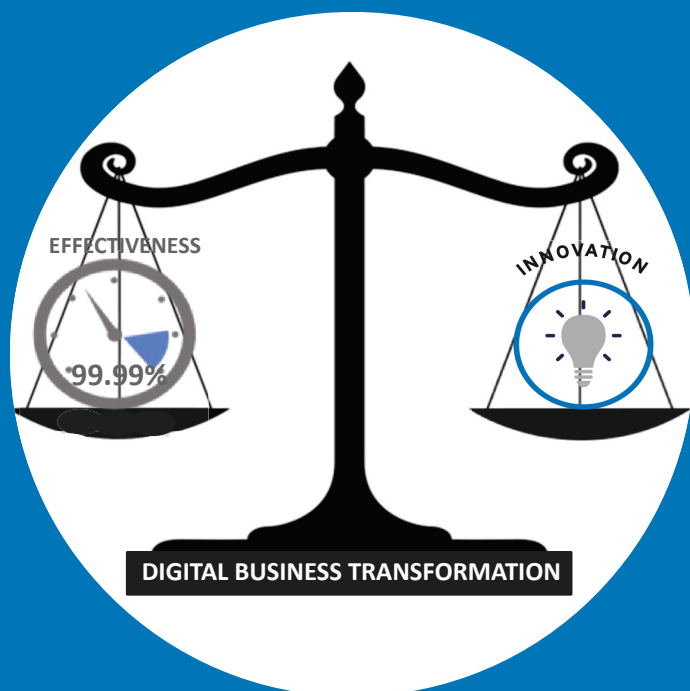


Digital Business Transformation Creates Hybrid Organizations with Ambidextrous Roles and Practices

Riitta Bekkhus



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Abstract

Digital business transformation (or digital transformation for short) is defined as *the use of digital technologies to radically improve a company's performance* (Fitzgerald et al., 2013). However, at present, digital transformation is not well understood, and many traditional companies struggle to gain transformational effects from new digital technologies. To truly drive value through digital transformation is to implement a new, successful digital business model. To succeed, traditional companies must learn to keep their existing business model productive (exploitative behaviour) and simultaneously introduce innovative services, products and practices into the new digital business model (explorative behaviour). Managing both business models simultaneously requires that companies learn to re-organize (that is, hybrid organize) their current organizational practices and roles. Therefore, the main objective of this dissertation is to contribute to the accumulating body of knowledge on digital transformation by exploring the following dissertation-level research question: *"How should companies re-organize themselves (that is, hybrid organize their roles, practices and behaviour) during the digital business transformation, in order to behave both exploitatively (to assure productivity of the existing business model) and exploratively (to further develop the new digital business model)?"*

The answer to the dissertation-level question was constructed from the main findings of the three publications included in this dissertation. *The answer includes a three-phase process model, which guides how firms should hybrid organize their roles, practices and behaviour during the digital transformation.* The other main contributions of this dissertation are: (1) the chain-reaction model of digital business transformation, which illustrates how the deployment of new digital technologies affects firms' business models and organizational structures; and (2) the new dualistic CIO toolbox, which Chief Information Officers and other managers can use to motivate their IT organizations to behave both exploitatively and exploratively (that is, ambidextrously). Additionally, this dissertation provides the following key predictions for the near future. Firstly, hybrid organizing is likely to become a key task for organizations soon after they begin the digital transformation. Secondly, firms will probably start to use new steering practices to create experimental ambidextrous organizational environments. Thirdly, the new digital employees (i.e. the software robots) will take over rule-based routines - forcing firms to re-tailor their traditional organizational roles and working practices. To summarize, this dissertation helps to understand how digital transformation affects firms' business models, organizational structures and practices, as well as how hybrid organizing helps firms to succeed in their digital transformations.

Keywords Digital business transformation, Digital business model, Hybridity, Ambidexterity, Organizational learning, Organizational design, IT management, Robotic process automation

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Tekijä

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Liiketoiminnan digitaalinen murros luo hybridiorganisaatioita uusine rooleineen ja käytäntöineen

Julkaisija Kauppakorkeakoulu**Yksikkö** Tieto- ja palvelutalouden laitos**Sarja** Aalto University publication series DOCTORAL DISSERTATIONS 205/2017**Tutkimusala** Tietojärjestelmätiede**Väitöspäivä** 15.12.2017**Kieli** Englanti **Monografia** **Artikkeliväitöskirja** **Esseeväitöskirja****Tiivistelmä**

Liiketoiminnan digitaalinen murros (tai lyhyesti digitaalinen murros) voidaan määritellä yrityksen suorituskyvyn parantamiseksi uusia digitaalisia teknologioita hyväksikäyttäen (Fitzgerald et al., 2013). Tällä hetkellä yrityksillä ei kuitenkaan ole riittävästi tietotaitoa siitä, miten digitaalinen murros pitäisi toteuttaa ja monet perinteiset yhtiöt kamppailevatkin saadakseen riittävästi hyötyä digitaalisista teknologioista. Todellisen arvon luominen digitaalisessa murroksessa kuitenkin edellyttää täysin uuden ja menestyksekkään digitaalisen liiketoimintamallin luomista. Jotta tämä onnistuisi, perinteisten yritysten on opittava samanaikaisesti hallitsemaan sekä vanhaa että uutta liiketoimintamalliaan. Nykyinen liiketoimintamalli on pidettävä tuottavana, jotta sen tuotot mahdollistaisivat uuden digitaalisen liiketoimintamallin kehittämisen. Molempien liiketoimintamallien samanaikainen hallinta kuitenkin edellyttää, että yritykset oppivat "uudelleenjärjestäytymään". Tämän vuoksi väitöskirjan päätavoitteena onkin lisätä tietotaitoa miten digitaalista murrosta pitäisi hallita ja siten löytää vastaus seuraavaan päätutkimuskysymykseen: *"Miten yritysten pitäisi digitaalisessa murroksessa uudelleenjärjestäytyä (eli hybridiorganisoida roolinsa, käytäntönsä ja käyttäytymisensä), jotta ne pystyisivät varmistamaan nykyisten liiketoimintamalliansa tuottavuus (exploitatiivinen käyttäytyminen) ja samalla kehittämään uusia digitaalisia liiketoimintamallejaan (exploratiivinen käyttäytyminen)?"*

Vastaus päätutkimuskysymykseen rakentuu väitöskirjan kolmen julkaisun päätuloksiin muodostaen kolmivaiheisen prosessimallin ohjaamaan yritysten uudelleenorganisointumista digitaalisessa murroksessa. Väitöskirjan muut keskeiset tuotokset ovat: (1) ketjureaktiomalli digitaalisen murroksen vaikutuksista yrityksen liiketoimintamalleihin ja organisaatorakenteisiin; (2) uusi dualistinen CIO-työkalupakki, jonka avulla tietohallintopäälliköt ja muut johtajat voivat motivoida organisaatioitaan käyttäytymään sekä tehokkaasti että innovatiivisesti digitaalisessa murroksessa. Lisäksi väitöskirjassa esitetään seuraavat keskeiset lähitulevaisuuden ennusteet. Ensinnäkin, hybridiorganisointi on todennäköisesti merkittävässä roolissa lähes jokaisessa lähitulevaisuuden digitaalisessa murroksessa. Toiseksi, yritykset luultavasti ottavat käyttöön uusia johtamiskäytäntöjä luodakseen kokeellisia ja monimuotoisia työympäristöjä. Kolmanneksi, uudet digitaaliset työntekijät (eli ohjelmistrobotit) uusine tehokkaine rutiineineen pakottavat yritykset muuttamaan perinteisiä toimintatapojaan. Tiivistettynä tämä väitöskirja auttaa ymmärtämään, miten digitaalinen murros vaikuttaa yritysten liiketoimintamalleihin, organisaatorakenteisiin ja -käytäntöihin sekä kuinka hybridiorganisointi auttaa yrityksiä onnistumaan omissa digitaalisissa murroksissaan.

Avainsanat Liiketoiminnan digitaalinen murros, Digitaalinen liiketoimintamalli, Hybriditeetti, Molempikäisyys, Organisaatio-oppi, Organisaatiosuunnittelu, IT johtaminen, Ohjelmistorobotiikka

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Writing this PhD dissertation has been a truly educational, if not mind-blowing journey for me. I still remember my fumbling start, but even better those “aha” moments, when I fully understood the reasons behind various organizational issues that I had previously taken for granted when working as a practitioner.

The two people I really want to thank are my supervisors. To begin with, I would like to thank my supervisor from “down under”: Dr. Petri Hallikainen from the University of Sydney Business School. His extremely good sense of humour, extensive knowledge of different organizational theories and, most of all, his positive attitude and willingness to help me were the cornerstones I could always rely on. I will sincerely miss our Skype meetings! I also want to thank my supervisor Professor Matti Rossi, who I could always consult and with whom I had long and interesting discussions about digitalization. Further, I want to thank him for the opportunity to mentor and lecture the master’s degree students, as I truly believe that the knowledge we gain is to be shared with others.

I also want to thank my preliminary examiners Professor Reima Suomi and Professor Jos Van Hillegersberg, for commenting my dissertation manuscript. Furthermore, I am deeply honoured to have Professor Reima Suomi as my opponent in the upcoming defence.

Further, my sincere thanks go to Jaakko Lehtinen from OpusCapita, who took the time to review the article on software robotics included in this dissertation. I would also like to thank him and his colleague Petri Karjalainen from OpusCapita for letting me join their seminars to discuss my research.

Last but not least, I want to thank my family who have supported me over the past two and half years. I want to thank my three children: Isabella, Camilla and Thomas, who somehow learned to cope with a mother who often stayed up at night and was constantly somewhat abstracted. But, especially, I want to thank my kind and patient husband, Jonny, who patiently listened to my explanations of various theories and phenomena that I was so excited about. Indeed, everybody in my family now knows what digital business transformation is all about. I also want to thank my sisters and brother (Marianne, Tarja and Pekka), and of course my wonderful and wise parents (Nelma and Pentti), who all motivated me to take this journey.

*Espoo, May 2017
Riitta Bekkhus*

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List of Publications

The publications listed below represent the original work that makes up the foundation of this doctoral thesis.

- Publication I:** Bekkhus, R. 2016. "Do KPIs used by CIOs decelerate Digital Business Transformation? The case of ITIL," in *Proceedings of the Twenty-First Digit Workshop (Digit2016 pre-conference for ICIS)*, Dublin, Ireland. Available at: <http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1014&context=digit2016>
- Publication II:** Bekkhus, R., and Hallikainen, P. 2017. "A new dualistic CIO toolbox: Towards Ambidexterity in the Digital Business Transformation," *17th Conference of the Portuguese Chapter of the Association of Information Systems (Capsi2017 pre-conference for ECIS)*, Guimaraes, Portugal. Available at: <http://capsi2017.apsi.pt/papers/Paper%2027.pdf>
- Publication III:** Hallikainen, P., Bekkhus, R., and Pan, S. 2017 (accepted as forthcoming to be published in March 2018). "Extending Internal RPA adoption to Offering Services for Clients: Journey of OpusCapita," *MIS Quarterly Executive*.

Author's Contribution

Publication I: Do KPIs used by CIOs Decelerate Digital Business Transformation? The Case of ITIL. Published in the proceedings of the Twenty-First Digit Workshop in Dublin (Digit2016 pre-conference for ICIS, December 2016). Available at:
<http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1014&context=digit2016>

Sole authorship.

Publication II: A new dualistic CIO toolbox: Towards Ambidexterity in the Digital Business Transformation. Published in the 17th Conference of the Portuguese Chapter of the Association of Information Systems (Capsi2017 pre-conference for ECIS, June 2017), Guimaraes, Portugal. Available at: <http://capsi2017.apsi.pt/papers/Paper%2027.pdf>

The idea of the paper was Riitta Bekkhus's. She used her extensive practical knowledge of IT management to be able to convert the organizational learning concepts into the IT context. Several rewritings and improvements of the paper were done by both of the authors. Dr. Petri Hallikainen especially worked in structuring the paper to meet the criteria of a publishable article.

Publication III: Extending Internal RPA adoption to Offering Services for Clients: Journey of OpusCapita – Accepted, 28.4.2017, to be published in MIS Quarterly Executive in March 2018.

The initial idea to research Robotic Process Automation came from Riitta Bekkhus. She also contacted the case company to receive an acceptance for the interviews and was responsible for conducting the first round of the interviews in two cities in Finland (Turku and Helsinki). The second interview round was conducted by all three authors (in June 2016 when Dr. Petri Hallikainen and Prof. Shan Pan had a chance to visit Finland). The idea to use the hybridity concept in the second interview round (and in the paper) came from Prof. Shan Pan. Riitta Bekkhus and the first author, Dr. Petri Hallikainen, wrote together the interview questions for both interview rounds and also analysed the collected data (after Riitta Bekkhus had transformed the recorded interviews into the written format).

According to the guidance given by Dr. Petri Hallikainen, the initial "fast" draft version of the paper was written by Riitta Bekkhus. Dr. Petri Hallikainen (the first author) made the later versions of the paper and assured the paper would meet the criteria of a publishable article. Riitta Bekkhus reviewed these later versions together with Prof. Shan Pan.

List of Key Concepts and Definitions

Business model: A business model can be defined as a conceptual tool (or core logic) that guides how business organizations generate revenue (Rappa, 2000; Petrovic et al., 2001; Torbay et al., 2002). **A digital business model** refers to a similar tool, but it is used in a much more complex and rapidly changing digital environment, making it more vulnerable but also more dynamic (Weill and Woerner, 2013b).

Digital business transformation: This techno-socio-economic phenomenon is defined in the literature as the use of digital technologies to radically improve a company's performance (Fitzgerald et al., 2013; Westerman et al., 2014b; Horlacher and Hess, 2016).

Hybridity: Hybridity has its origin in biology, where it refers to a stable mix of different species. *"For example, a mule is a hybrid, but a chameleon, due to the contingent nature of its multiple forms, is not"* (Battilana and Lee, 2014, p. 400). Therefore, *"hybrids are not de novo objects composed entirely a new, but are rather inter alia objects, composed through the recombination of existing elements. Hybridity also requires that the combination of parts be central and persistent within a given entity, rather than adaptive and transitory"* (Battilana and Lee, 2014, p. 400). In an organizational environment, *"hybrid organizations combine the institutional logics that are materialized in two or more organizational forms"* (Haveman and Rao, 2006, p. 974). For instance, organizations that adopt both manufacturing and information technology practices and structures. For more on hybridity, see Section 2.2.

Hybrid organizing: Hybrid organizing is defined as *"the activities, structures, processes, and meanings by which organizations make sense of and combine aspects of multiple organizational forms"* (Battilana and Lee, 2014, p. 398). This means that hybrid organizing includes company-level activities that aim to re-form organizational structures with related roles and practices, so that these "transformed components" become ambidextrous and can hence be used to manage parallel business models (or forms). For more on hybrid organizing, see Section 2.2.

Organizational ambidexterity: March (1991) proposes that an organization's ambidextrous *behaviour* should be divided into exploitative and explorative behaviours. Exploitative organizational behaviour is meant to achieve short-term peak performance (March, 1991; Smith and Lewis, 2011) and *"exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution"* (March, 1991, p. 71). Explorative organizational behaviour is instead meant to ensure long-term success (March, 1991; Smith and Lewis, 2011) and *"exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation"* (March, 1991, p. 71).

Ambidextrous organizational environment: An environment where an organization can *behave* both exploitatively (effectively routinized) and exploratively (innovatively). Argyris and Schön (1974) described such an environment as a Model II regulated (principled) environment (see Section 2.1). It is worth noting that when practitioners talk about *digital business agile environments*, they are referring to organizational environments in which organizations are able to both exploit and explore (EY, 2013; Wade, 2015; World Economic Forum, 2017).

Organizational learning: In his book on “The Sciences of the Artificial”, Simon (1969) introduced different aspects of human learning (discovery, experimenting, learning-by-doing, selectivity, learning by rote or with understanding, etc.). He also explained that the complexity of human behaviour (learning) reflects the complexity of the environment, pointing out that learning in complex environments, e.g. inside organizations, is far more complex than individual learning in a restricted environment. His explanations, however, confused scholars for years (Fiol and Lyles, 1985), and many new definitions of organizational learning were introduced after Simon (1969). This dissertation uses the definition of organizational learning offered by Argyris and Schön (1974). They define organizational learning as a process of detecting and correcting errors, and note that an error is any feature of knowledge or knowing that inhibits learning. Argyris and Schön also explained that when a process enables an organization to continue its present policies or achieve its objectives, the process may be called single-loop learning (Argyris, 1977), but when an organization begins to doubt and question the underlying organizational policies, and starts to change these policies and their related actions, the process may be called double-loop learning (Argyris, 1977). For more on organizational learning, see Section 2.1.

1. Introduction

This dissertation contains two parts. Part I includes an overall outline of the dissertation (Section 1), its theoretical background (Section 2), the methodological choices (Section 3), summaries of the original research articles (Section 4), and the discussion and final conclusions (Section 5). Part II features the original research articles.

1.1. Background and motivation

“We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before” (World Economic Forum, 2016c).

Currently, organizations of all sizes are forming opinions on digitalization. Some organizations have already stepped into the digital era and have started to utilize various digital technologies, whereas others are still waiting to take this essential step. The process that leads organizations into the digital era is called a *digital business transformation*. Digital business transformation (or digital transformation for short) is defined as the use of digital technologies to radically improve a company’s performance (Fitzgerald et al., 2013; Westerman et al., 2014b; Horlacher and Hess, 2016). The radical improvements are not just achieved through the separate use of new digital technologies (e.g. mobile, cloud, robotics, artificial intelligence, social media, sensors and analytics, among others), but from the ‘combinatorial’ effects of these new technologies, as the technological combination accelerates progress exponentially (World Economic Forum, 2016a). According to the World Economic Forum *“it used to take Fortune 500 companies an average of 20 years to reach a billion-dollar valuation; today’s digital start-ups are getting there in four”* (World Economic Forum, 2016a).

However, at present, digital business transformation is not well understood, and many traditional companies struggle to gain transformational effects from new digital technologies (World Economic Forum, 2016a; Fitzgerald et al., 2013). Only a few traditional companies have been able to use digital technologies to drive significantly higher levels of profit, productivity and performance (Westerman et al., 2014a). This is because a majority of companies have not been able to develop their management and technology skills to realize the potential of new technologies (Fitzgerald et al., 2013; Gartner, 2014). One typical misconception is *“the belief that companies can implement a successful digital transformation simply by launching a digital business unit and hiring a Chief Digital Officer”* (World Economic Forum, 2016b). Instead, companies should fundamentally rethink their operating models, revamp how they attract and foster digital talent, and consider afresh how they measure the success of their business (Wade, 2015; World Economic Forum, 2016b).

Companies that learn how to effectively manage digital technologies (and the combinations of these technologies) can expect to improve in one or more of these three areas: **customer enhancements, streamlined operations and new lines of business or business models** (Fitzgerald et al., 2013; Westerman et al., 2014a). Customer enhancements and streamlining existing

operations are relatively easy to achieve, whereas the *business model transformation* is much more difficult to achieve and is far less prevalent (Fitzgerald et al., 2013). However, if the company succeeds in achieving an effective business model transformation, it will be the most profitable approach to digitalization. According to a 2011 survey of 391 large companies conducted by MIT Sloan and Gaggemini Consulting, companies that have truly understood how to drive value through digital transformation are approximately 26% more profitable than their industry competitors (Westerman et al., 2012).

Against this background, implementing a new successful **digital business model** is key to digital transformation, and prior research has advocated the need to develop a guiding digital business vision or strategy before this implementation (Bharadwaj et al., 2013; Westerman et al., 2014a). One should, however, not underestimate “the power of experimenting”. For instance, the company can start its digital journey by experimenting with various digital technologies (to improve its internal operations or customer enhancements) and will, in this way, be better equipped to recognize new digital business model opportunities. Our case-study company (in Article III) chose the experimental approach. The company first experimented with a new digital technology to streamline its internal operations, and only then it was able to recognize a potential new revenue model of digital consultancy.

No matter how a company finds its new successful digital business model, it is common for these companies to become hybrids – at least during the transformation period. Hybrids combine aspects of multiple organizational forms (Haveman and Rao, 2006; Jay, 2013). For example, our case-study company in Article III managed to combine their traditional outsourcing model and digital consultancy business model. The challenge of becoming a hybrid is learning how to steer and manage parallel business model environments simultaneously. Managing this challenge usually requires that companies learn to **hybrid organize**.

Hybrid organizing is defined as “*the activities, structures, processes, and meanings by which organizations make sense of and combine aspects of multiple organizational forms*” (Battilana and Lee, 2014, p. 398). Hybrid organizing includes activities to re-form organizational structures, roles and practices, so that these transformed components can be used to steer and manage the parallel business models simultaneously. The ultimate goal of hybrid organizing is to create an *ambidextrous organizational environment*, where an organization can behave ambidextrously (“both-handed”). This means that the organization can behave both *exploitatively* to achieve short-term targets (via exploiting the traditional services, products, technologies and work practices), as well as *exploratively* to assure long-term targets are met (via exploring new business possibilities enabled by new digital technologies).

A number of companies have already engaged in hybrid organizing. A set of four examples are explained here. The first two companies learned about hybrid organizing when improving their existing business models. The coffee shop chain Starbucks started its digital journey by improving customer enhancements. It offered free Wi-Fi services, with free online newspapers, in Starbucks stores. Later, customers were also able to order and pay using mobiles (Fitzgerald et al., 2013; Dignan, 2015). All of this changed their ordering, delivery and storage processes. “*Using social media, mobile and other technologies to change customer relationships, operations and the business model has helped Starbucks re-engage with customers and boosted overall performance*”

(Fitzgerald et al., 2013, p. 3). Another example is a Finnish financial outsourcing company, OpusCapita, the case-study company in Article III. While streamlining their internal outsourcing processes (with the help of robotic process automation), OpusCapita recognized a new revenue possibility enabled by digital consultancy. In order to manage their parallel business model environments simultaneously, OpusCapita started hybrid organizing by re-structuring and re-forming their organizational structures with related roles and practices.

The next two examples feature companies that learned hybrid organizing while systematically implementing their new digital business models. The first example is the jeans producer Levi's, which recently (together with the Google Corporation) invented a new type of material that can conduct electricity and therefore be used to communicate with smartphones (Illustrerad Vetenskap, 2016). To illustrate this, touching the material enables you to answer your smartphone without taking it out of your pocket. This is handy, for example, when riding a bike or when outside in cold weather. Their new digital business model of conductive materials requires Levi's to hybrid organize – to re-form their existing organizational structure with related organizational roles and practices. The second example is an all-electric racing championship company, Formula E, which recently introduced the concept of digitalized virtual races, which non-professional drivers can also participate in (Standaert and Jarvenpaa, 2016). Formula E also plans to arrange races without drivers. Different engineering teams would develop robotic drivers with artificial intelligence to race against each other on the real Formula E tracks (Standaert and Jarvenpaa, 2016). Formula E, with its new digital business models, is also required to re-arrange its current organizational structure with related organizational roles and practices, as part of its hybrid organizing.

1.2. Phenomena of interest and the main research question

As described in the previous section, digital business transformation is not yet well understood, and many traditional companies struggle to produce transformational effects from new digital technologies. Gaining the maximal transformational effects starts by understanding how digital business transformation needs to be managed. Therefore, this dissertation studies two organizational phenomena, hybrid organizing and organizational ambidexterity, and explores how these phenomena affect the successful digital business transformation. Both phenomena are briefly explained in the following paragraphs.

Battilana and Lee (2014, p. 398) introduced a term *hybrid organizing*, which is defined as “*the activities, structures, processes, and meanings by which organizations make sense of and combine aspects of multiple organizational forms*”. Hybrid organizing is used in this dissertation (see Article III) as a lens to study how the case-study company re-arranges its organizational roles and practices to manage its traditional and new business models simultaneously. Further discussion of hybrid organizing can be found in Section 2.2.

The word “ambidexterity” is defined in the Merriam-Webster Dictionary as “*the quality or state of being ambidextrous*”, whereas the word “ambidextrous” is defined as “*using both hands with equal ease*”. Organizational scholars note that successful organizations are ambidextrous – aligned and efficient in the management of today's business demands, while ***simultaneously***

adaptive to changes in the environment (March, 1991; Tushman and O'Reilly, 1996; Gibson and Birkinshaw, 2004). These two behaviour types are *exploitative* behaviour (ensuring today's short-term business demands are met) and *explorative* behaviour (ensuring tomorrow's long-term demands are met). Organizational ambidexterity is used in this dissertation (specifically in Articles I and II) as a lens to study the CIO's new ambidextrous role. For more on organizational ambidexterity, see Section 2.3. It should also be noted that Argyris and Schön (1974) introduced a Model II regulated (principled) environment, in which the organization can behave ambidextrously (see Section 2.1).

The main goal of this dissertation is to investigate these two phenomena using the following dissertation-level research question: *“How should companies re-organize themselves (that is, hybrid organize their roles, practices and behaviour) during the digital business transformation, in order to behave both exploitatively (to assure productivity of the existing business model) and exploratively (to further develop the new digital business model)?”*

1.3. Outline of the dissertation

Building on previous studies and the research conducted in this dissertation, the following chain-reaction model of digital business transformation is proposed (see Figure 1). The model also describes the main logic of the study and hence summarizes the entire dissertation.

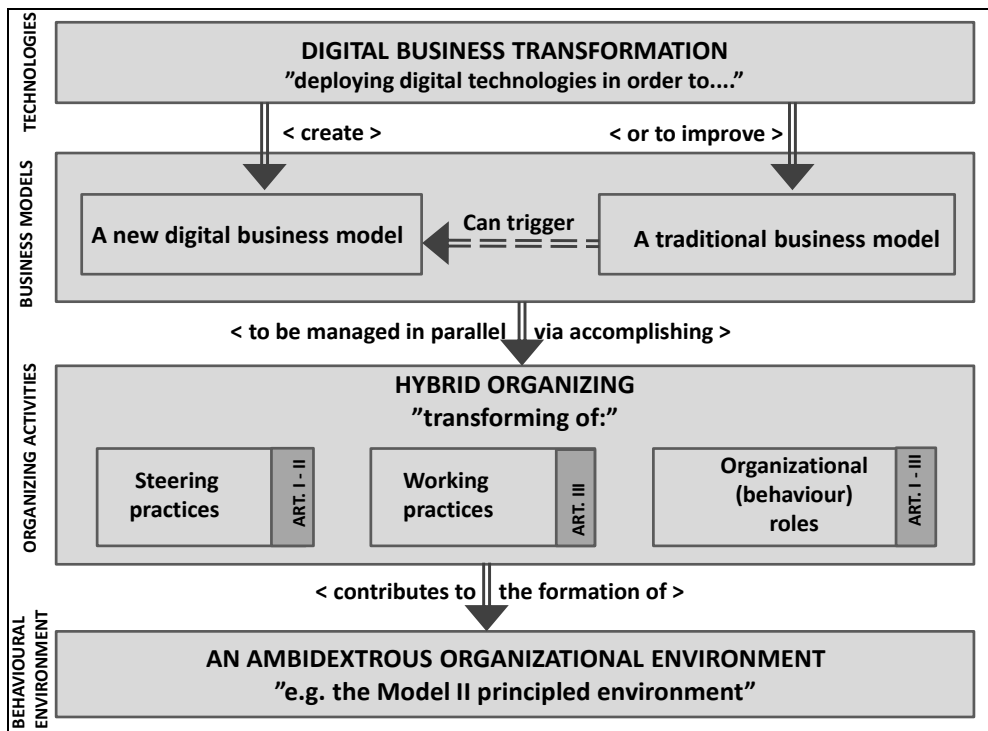


Figure 1. The outline overall structure of the dissertation (the chain-reaction model of the digital business transformation).

As outlined in Figure 1, digital business transformation enables companies to create new digital business models, in parallel to their traditional ones. This can happen either as a result of a systematic plan, or “unintentionally” (Battilana and Lee, 2014) while experimenting with new digital technologies in an effort to improve internal operations or customer enhancements. A company that manages to create a new digital business model in parallel to its existing model will need to learn how to manage them simultaneously. This requires the company to re-arrange (hybrid organize) its current organizational structures, practices and behaviour (such as steering practices, working practices and organizational behaviour roles).

The ultimate goal of hybrid organizing is to achieve an ambidextrous organizational environment, in which the organization is able to exploit its traditional business environment as well as explore the new digital business environment. To achieve an ambidextrous organizational environment – what Argyris and Schön (1974) described as a Model II regulated (principled) environment – requires that the hybrid company implements at least the following three organizational changes.

Firstly, the hybrid company needs to transform its organizational *steering practices*. The steering practices, which mostly relate to the organization’s exploitative behaviour (assuring an effective, stable and accurate production environment), should now be adjusted to motivate the organization to also innovate and experiment. **Articles I and II discuss this subject.** Article I criticizes the current metric-driven steering practices and demonstrates why the use of these practices only motivates exploitative behaviour. Article II, in turn, develops a set of new leadership principles to supplement the current metric-driven steering practices. This new dualistic CIO toolbox was primarily developed to help Chief Information Officers motivate IT organizations to behave ambidextrously, but other managers can also use the tool to steer organizations towards ambidexterity.

Secondly, the hybrid company needs to transform its *working practices*. The working practices will be divided into exploitative and explorative tasks. Notter (2015) explains that, as the digital mindset propagates customization and flexibility as core values, it will simultaneously challenge work practices that rely on predictability, uniformity and consistency. Therefore, many well-established, almost institutionalized, organizational practices, which were originally developed to master the predictable and uniform traditional business environments, will undergo a transformation. These procedures will be replaced by less manual and more effective practices enabled by new digital technologies, such as robotic process automation, artificial intelligence, sensor technology and data analytics. **Article III discusses this subject.** Article III specifies how working practices are divided into exploitative (routinized and repeatable) and explorative (innovative) working tasks, and notes how these tasks are performed either by digital or human employees.

Thirdly, the hybrid company needs to re-shape its organizational structures with related organizational *roles*. Basically, all organizational roles at different organizational levels will be affected. For example:

- *The office employee roles* will change. Some employee roles will be divided into exploitative and explorative sub-roles. In our case-study company (see Article III), the payroll employee role was divided into two sub-roles. Quality control of salaries, which had previously been carried out by human employees, was transferred to the software robots during the

digitalization project. After the software robots had taken over the controlling role, the quality of the payroll process increased significantly and, hence, the number of client complaints was reduced. This increased employee satisfaction as staff could now spend more time developing their work practices and client services, and less time handling customer complaints or manually performing controlling routines. As routinized work assignments are moved from humans to robots, the work roles “left” for humans will require explorative skills, such as innovativeness, human experience and moral understanding. Roles requiring such skills exist in sales, customer service, development and advanced decision-making. As the robotic technology advances, the robots will also learn how to perform even more advanced rule-based tasks (and can, in that sense, become more explorative). **Article III discusses the changing office employee roles.**

- **Organizational unit roles**, like the IT organization role, will also change. IT organizations will be expected to collaborate more with the rest of the organization, in order to contribute to the digital business transformation in the form of new digital services, products or practices. **Articles I and II discuss this subject** by criticizing how the current steering practices only reinforce the IT organization’s static “gatekeeper role” and do not motivate IT organizations to collaboratively contribute to the digital business transformation. **Article III also discusses this subject** by explaining how the organizational unit roles (e.g. IT, business and production) become ambidextrous during the hybrid organizing.
- **Manager roles**, such as the CIO role, will also change. CIOs will be expected to extend their roles from technologists to business strategists, while spending less time managing IT and more time deploying new business innovations and improvements enabled by the new digital technologies (Broadbent and Kitzis, 2004; Leidner and Mackay, 2007; Peppard 2010; Carter et al., 2011; Kettinger et al., 2011; Weill and Woerner, 2013; Gartner Inc., 2014). On the other hand, the CIO role can also be divided into exploitative and explorative sub-roles (as with the payroll employee role in our case-study company in Article III). The exploitative IT-related work would then be performed by CIOs, and the explorative work carried out by Chief Digital Officers (CDOs). This dissertation, however, does not discuss this matter, as the majority of today’s companies still do not have a CDO. In fact, according to a 2015 survey by PricewaterhouseCoopers, only six percent of the 1500 largest global companies in the world had recruited CDOs (PWC, 2015). Additionally, dividing such an important managerial role into two sub-roles can cause unnecessary tensions between these roles, negatively affecting the digital business transformation. **Article II and partly Article I focus on studying the CIO’s new ambidextrous role.**

To summarize, digital business transformation challenges companies to fundamentally rethink their current operating models (Wade, 2015; World Economic Forum, 2016b). To truly drive value through digital business transformation is to implement a new, successful digital business model. This, however, turns companies into hybrids (with multiple organizational forms managing multiple business models) and requires companies to re-organize their structural components and behavioural environments.

2. Theoretical foundation and position

Three main organizational theories are used in this dissertation. Sections 2.1–2.3 describe these three theories and the reasons why they were selected.

2.1. Organizational learning

This section explains how learning theories can, in general, be divided into two categories. It also describes the organizational learning theory of Argyris and Schön (1974) and explains why this particular theory was selected as a theoretical lens in Articles I and II of this dissertation.

2.1.1. Learning theories

Learning theories can generally be divided into two categories: individual and organizational learning. Some individual learning theories are based on stimulus-response behaviour, whereas others focus on cognitive capabilities or psychodynamic theory (Kim, 1993). In the early stages of an organization's existence, organizational learning is often synonymous with individual learning, but when an organization grows, the learning process becomes more complex and a distinction between individual learning and organizational learning appears (Kim, 1993). *“Organizational learning is more complex and dynamic than a mere magnification of individual learning. The level of complexity increases tremendously when we go from a single individual to a large collection of diverse individuals. Issues of motivation and reward, for instance, which are an integral part of human learning, become doubly complicated within organizations”* (Kim, 1993, p.40).

Often, individual learning theories also serve as a foundation to create new organizational learning theories (Kim, 1993). *“For example, adaptation theories can be viewed as analogs of individual stimulus-response theories and strategic choice models having similarities with psychodynamic theories”* (Kim, 1993, p. 49). However, as the learning environments (including organizational interactions, processes, rules, norms and limitations) are far more complex for organizations than for singular individuals (or very few individuals), this difference in complexity should therefore be considered when developing new organizational learning theories.

2.1.2. Reasoning behind the selected approach

As this dissertation (specifically Articles I and II) creates two conceptual frameworks for use in organizational environments, it was natural to choose an **organizational learning theory** (rather than an individual learning theory) as a foundation to build these frameworks. While there are several different types of organizational learning theories, the approach taken by Argyris and Schön (1974) was particularly suited to the purposes of this dissertation.

Firstly, the organizational learning theory of Argyris and Schön (1974) was developed to take into account the complexity and variety of organizational environments, as their theory describes two different types of organizational environments (Model I and II). Model I represents the typical organizational environment in which an organization functions before they begin the digital business transformation, whereas Model II is the target environment for any organization which

wants to succeed in the digital business transformation. Secondly, the organizational learning concepts (such as the single-, double- and triple-loop learning concepts included in organizational learning theory) have been empirically tested multiple times over several decades by Argyris and Schön. Therefore, the learning concepts are well-suited (reliable) for use as “building blocks” to construct conceptual frameworks (as shown in Articles I and II). Thirdly, organizational learning theory also describes (in detail) how organizational norms and values affect learning behaviour. This is especially important for companies which are about to undergo a digital business transformation, as these companies must learn to question (and alter) their current values, norms, limitations and ways of working to truly succeed in the digital business transformation.

2.1.3. The selected organizational learning theory

The organizational learning theory of Argyris and Schön (1974) was developed to take into account the complexity and variety of organizational environments. In their organizational learning theory, Argyris and Schön (1974) categorized organizational environments into two main types (Model I and Model II principles) and described how the organization learns and behaves in these two environments (see Figure 2).

The two models differ in how they allow, or prohibit, the organization to change its existing organizational targets, norms and limitations (governing values), and the way in which the organization is measured and motivated. In other words, the models include different organizational principles which are used to steer and motivate the organization; principles, which the organization obeys.

In **Model I**, the organization is steered by using the effectiveness, correctness and stability metrics, as the organization is only allowed to exhibit routinized learning behaviours. Whereas, in **Model II**, the organization is allowed to behave both exploitatively (routinized) and exploratively (innovatively), that is, to behave ambidextrously.

Argyris and Schön (1974) defined three different learning types: single-, double- and triple-loop (deutero) learning. Only the single-loop learning can take place in Model I, whereas in Model II all three learning types can occur. Single-loop learning is *“concerned primarily with effectiveness - that is, with how best to achieve the existing goals and objectives and how best to keep organizational performance within the range specified by existing norms”* (Argyris and Schön, 1978, p. 21). Single-loop learning can be understood as a repeatable and routinized work behaviour, which aims to achieve an effective, accurate and stable organizational environment by avoiding any unnecessary changes which could risk these targets. The single-loop learning does not allow questioning the existing norms, targets or limitations assigned to the organization as *“single-loop learning occurs when errors are corrected without altering the underlying governing values”* (Argyris, 2002, p. 206). Single-loop learning corresponds to exploitative learning of March, 1991.

Double-loop learning (Argyris and Schön, 1974) allows the existing organizational norms, targets and limitations to be questioned and altered, as *“double-loop learning occurs when errors are corrected by changing the governing values and then the actions”* (Argyris, 2002, p. 206). Triple-

loop (deutero) learning, in turn, occurs when an organization learns how to optimize single-loop learning or improve double-loop learning (Argyris, 2003) based on prior experience of learning situations, as shown in Figure 2. “They discover what they did that facilitated or inhibited learning, they invent new strategies for learning, they produce these strategies, and they evaluate and generalize what they have produced” (Argyris and Schön, 1978, p. 27). Double- and triple-loop learning both aim to foster innovative and experimental organizational behaviour, and each corresponds to the explorative learning of March (1991). Figure 2 explains how the three learning-loop concepts correspond to exploitative and explorative learning.

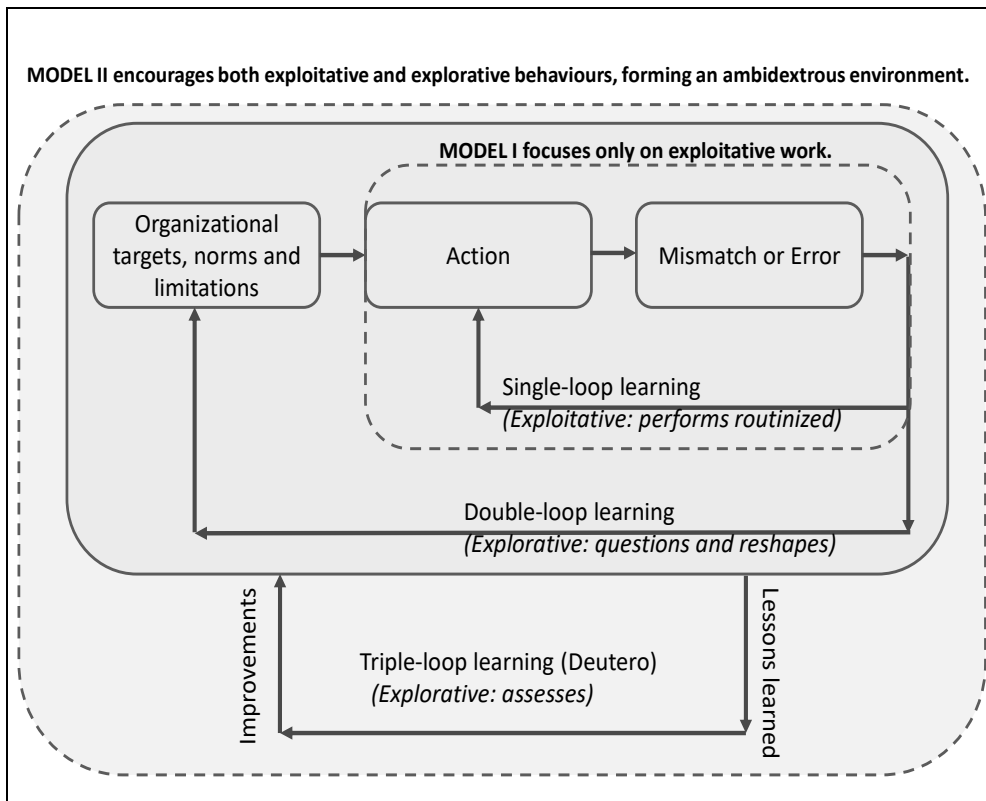


Figure 2. Models I and II, adapted from Argyris’ original version (Argyris, 1990, p. 94; Argyris and Schön, 1978, pp. 142–143) by the addition of triple-loop learning.

Traditionally, IT organizations function according to the Model I regulated (principled) environment. A CIO assigns pre-defined targets to the IT organization to assure that the IT environment will be as effective, stable and accurate as possible. These specific pre-defined single-loop targets will therefore become the IT organization’s main point of focus. Instead, if the CIO’s current metric-driven steering practices were upgraded to motivate the IT organization to behave in a way that is both routinized (using single-loop learning) and innovative (using double- and triple-loop learning), the organization would function in an ambidextrous mode, enabling an ambidextrous organizational environment to arise.

Argyris and Schön (1974) describe such an ambidextrous organizational environment as the Model II regulated (principled) environment. In Model II, the IT organization would be encouraged to question the organization's current targets, norms, limitations and ways of working. The IT organization would also openly share what they have previously learned, as they would be able to talk about taboos and would be encouraged to experiment, regardless of whether these experiments work or not. Model II decreases organizational defensiveness and increases organizational commitment, as the unilateral (top-down) control is rejected and power can be shared *"with anyone who has competence, and with anyone who is relevant in deciding or implementing the action, in the definition of the task, or the control over the environment"* (Argyris 1976, p.369). This produces more valid information when errors occur, as failures can be communicated openly and the organization can learn from the feedback (Argyris 1976). Hence, Model II enables organizations to take risks, create trust, and enables greater freedom of choice (Argyris 1977). An organization that is allowed to think outside the existing norms and boundaries will therefore be more effective in solving problems and finding new, innovative ways of working.

To summarize, in the Model II regulated (principled) environment, the IT organization can truly behave ambidextrously. The IT organization would be motivated to both assure the operative targets for the existing IT environment (by using exploitative single-loop learning methods), as well as co-invent, collaboratively with other units, better services, products and practices (by using explorative double- and triple-loop learning methods).

2.2. Organizational hybridity

This section explains how organizational hybridity theories can be divided into four main streams. It also explains why a particular theory of hybridity was selected as a theoretical lens in this dissertation (specifically in Article III and the dissertation-level research question).

2.2.1. Research streams on hybridity

"Hybrids are not de novo objects composed entirely a new, but are rather inter alia objects, composed through the recombination of existing elements. Hybridity also requires that the combination of parts be central and persistent within a given entity, rather than adaptive and transitory. For example, a mule is a hybrid, but a chameleon, due to the contingent nature of its multiple forms, is not" (Battilana and Lee, 2014, p. 400).

Various social-structural conditions (including technological, political, social, competitive and institutional factors) can promote or impede the formation of hybrid organizations (Haveman and Rao, 2006). Digital business transformation is an example of a social-structural condition which promotes the formation of hybrid organizations with multiple organizational forms. These forms *"may include planned, deliberate combinations oriented toward the pursuit of new opportunities, or unintentional combinations occurring by accident or due to unanticipated external change"* (Battilana and Lee, 2014, p. 401).

Becoming a hybrid firm has both positive and negative consequences. Combining multiple logics under one organizational roof can create important sites of innovation (Reay and Hinings, 2009).

This is because combining logics brings together novel combinations of tacit knowledge (Jay, 2013), known as innovations. Innovativeness, which is a positive consequence of hybridity, is essential in order to succeed in the digital business transformation. However, combining different organizational logics can also bring about organizational instability and changes, which cause both internal and external tensions in the organization (Jay, 2013). The negative effects of hybridity were also experienced by the case-study company in Article III, when employees feared losing their jobs to the new digital employees (software robots).

According to Battilana and Lee (2014), scholarly work on **organizational hybridity can be divided into four research streams**. Table 1 illustrates these four approaches to studying organizational hybridity.

Stream #1:	Stream #2:	Stream #3:	Stream #4:
<p>Hybrid Identity:</p> <p>The stream studies how multiple organizational identities are either:</p> <ul style="list-style-type: none"> • Shared across the entire organization or • Carried by subgroups within the organization. 	<p>Hybridity of multiple organizational form:</p> <p>The stream studies how organizations manage to combine different organizational forms.</p>	<p>Hybridity of multiple institutional logics:</p> <p>The stream studies how organizations manage to combine multiple institutional logics.</p>	<p>Hybrid organizing:</p> <p>The stream combines other three streams by studying how organizations re-structure (hybrid organize) their current structures, roles, practices and behaviour.</p>

Table 1. Four research streams of organizational hybridity (according to Battilana and Lee, 2014).

Stream #1 studies organizational hybridity by focusing on organizational identities. The stream focuses on studying multiple identities, which are either shared across the entire organization or only carried by subgroups within the organization.

Stream #2 studies organizational hybridity as a combination of multiple organizational forms. In such organizations *“there is a combination of public and private organizing logics, through mission-driven businesses, social enterprises, cross-sectoral collaboration, and public-private partnerships of various kinds”* (Jay, 2013, p. 137). Each organizational form (of hybrid) consists of a particular cluster of features (Polos et al., 2002), which are shared among organizations that enact this form. *“Forms become institutionalized over time as they acquire legitimacy, a “taken-for-grantedness” that accrues to established forms and facilitates access to unique resource niches”* (Battilana and Lee, 2014, p. 401). Therefore, hybrid organizations, such as industry-IT companies, which need to manage different organizational forms with different business models, will also need to manage different institutionalized logics.

Stream #3 studies organizational hybridity as a combination of multiple institutional logics, which can be “materialized” in two or more organizational forms (Haveman and Rao, 2006). Institutional logics can be explained as taken-for-granted beliefs, rules and practices – which are symbolically grounded, organizationally structured, politically defended and technically and materially constrained – that guide actors’ behaviour in fields of activity (Friedland and Alford, 1991). Taken-for-granted beliefs and practices can include different legislative constraints and regulations, various industry standards, best practices of the branch and unique employee know-how. The case-study company in Article III is a good example of a firm combining two different institutional

logics. Both of its business models (adaptive consultancy business model and standardized outsourcing business model) have their own institutional logics, which the case-study company has “materialized” within its own organizational forms (organizational teams, roles and practices).

Stream #4 attempts to combine three previously mentioned research streams (1–3) in studying organizational hybridity. Battilana and Lee (2014) explain that, even though scientists have largely reached convergent insights on hybridity in terms of organizational identity, organizational form, and institutional logic, these three research streams have still evolved in separate ways in the literature. To combine these different approaches to studying organizational hybridity, Battilana and Lee (2014) introduced the theory of **hybrid organizing**.

Battilana and Lee (2014, p. 398) define hybrid organizing as “*the activities, structures, processes, and meanings by which organizations make sense of and combine aspects of multiple organizational forms*”. The authors state that “*hybrid organizing is at play in five key areas of organizational life, namely (1) core organizational activities, (2) workforce composition, (3) organizational design, (4) inter-organizational relationships, and (5) organizational culture*” (Battilana and Lee, 2014, p. 412). These five key areas of hybrid organizing (as defined by Battilana and Lee, 2014) are further explained below.

- (1) Re-arranging the core organizational activities means that some activities will be shared by both, or multiple, organizational forms (integrated activities), whereas other activities will only be used by one organizational form.
- (2) In workforce composition, the hybrid company typically re-arranges its workforce in ways that allow individuals from different sectors to work together effectively, as it is rarely possible to populate the hybrid enterprise with “hybrid individuals”.
- (3) Organizational design includes management activities to define formal organizational structures, incentives, control systems, and governance to administer the hybrid organization. The leadership of a hybrid company needs to “harmonize” the incentives, control systems and governance methods that cover both (or multiple) organizational forms.
- (4) Inter-organizational relationships include relationships with other organizations, which also need to be adjusted. For example, the tendering processes (for each business model) should be internally coordinated to avoid purchasing same (or overlapping) services from several providers.
- (5) The last, but not least, dimension of hybrid organizing is organizational culture. “*Organizational culture shapes how organizational members make sense of themselves and their organization*” (Battilana and Lee, 2014, p. 421). Creating a new common organizational culture is a particularly challenging task for leaders of hybrid organizations, especially when both exploitative and explorative behaviours must be incorporated.

To summarize, hybrid organizing includes activities to re-arrange organizational structures with related organizational roles and practices, so that these “transformed components” become ambidextrous and, hence, can be used to steer and manage multiple business models. The ultimate goal of hybrid organizing is, therefore, to create ambidextrous organizational environments (organizational cultures), in which the organization can behave both exploitatively and exploratively. It is worth noting that the Model II regulated (principled) environment described by Argyris and Schön (1974) defines the characteristics of such ambidextrous

organizational environments (see Section 2.1). Table 2 lists some examples of all four research streams.

Stream:	Example:	Focus:
Stream #1	Glynn, 2000; Jay, 2013; Abbott et al., 2013; Dahlberg-Grundberg, 2016.	Focusing on the organization's hybrid identity.
Stream #2	Haveman and Rao, 2006; Bloomfield and Hayes, 2009.	Focusing on multiple organizational forms of an organization.
Stream #3	Pache and Santos, 2013; Chadwick, 2007.	Focusing on multiple organizational logics of an organization.
Stream #4	Battilana and Lee, 2014.	Focusing on how the firms should organize themselves via the hybrid organizing in order to tackle multiple organizational forms (managing multiple business models).

Table 2. Examples of organizational hybridity studies.

2.2.2. Selected approach to studying hybridity

As this dissertation (specifically Article III and the dissertation-level research question) focuses on studying how firms should **re-organize** themselves during the digital business transformation, the dissertation clearly **belongs to Stream #4, which studies hybrid organizing** (see Table 1). However, the dissertation also partially addresses the other three streams, because Stream #4 is a combination of these other streams.

Stream #1 is partially covered in the sense that the case-study company in Article III gains two different organizational identities. The organization's original identity as a business process outsourcing supplier (which aims to standardize solutions) is accompanied by a new organizational identity, namely, that of providing digital consultancy and tailoring services (which aims to customize the solutions). Hybrid identity, however, is not the main focus of Article III, therefore Stream #1 is only partially covered. The dissertation also partially belongs to Stream #2, as the case-study company in Article III becomes a hybrid by combining two different business forms (outsourcing and consultancy) that each have their own specific business models. However, Stream #2 is not the main focus of Article III and, hence, is only partially covered. Finally, the dissertation belongs partially to Stream #3, as the case-study company in Article III becomes a hybrid by combining two different institutional logics (standardized outsourcing practices vs. customized digital consultancy practices). However, institutional logics are not a focal part of the discussion, either in Article III or elsewhere in the dissertation, and hence Stream #3 is only partially covered.

2.3. Organizational ambidexterity

This section describes how organizational ambidexterity theories can be divided into three main areas of focus. It also explains why one particular theory of ambidexterity was selected as a theoretical lens in Articles I and II of this dissertation.

2.3.1. Approaches to studying ambidexterity

Duncan (1976) was the first to present a theory of organizational ambidexterity. Over a decade later, March (1991) and Tushman and O’Reilly (1996) continued to bring the concept of organizational ambidexterity into research on organizations (Raisch et al., 2009). March (1991) explained that firms divide their attention and resources between two fundamentally different learning activities: exploitation and exploration. Exploitative organizational behaviour is meant to achieve short-term peak performance (Smith and Lewis, 2011) and “*exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution*” (March, 1991, p. 71). Explorative organizational behaviour is meant to ensure long-term success (Smith and Lewis, 2011) and “*exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation*” (March, 1991, p. 71).

An organization behaves **ambidextrously** when it, at the same time, behaves both exploitatively and exploratively. Exploration and exploitation indeed reinforce one another, as without exploration there is no organizational knowledge to exploit, and without exploitation the firm lacks the foundational knowledge that fuels experimentation (Smith and Lewis, 2011). Indeed, overall organizational success depends on its ambidextrous behaviour (March, 1991; Tushman and O’Reilly, 1996; Gibson and Birkinshaw, 2004). It is worth noting that the Model II regulated (principled) environment of Argyris and Schön (1974), discussed in Articles I and II, defines the characteristics of an organizational environment in which both exploitative and explorative learning behaviours are encouraged. For more on Model II, see Section 2.1.

According to Raisch and Birkenshaw (2008), scholarly work on organizational ambidexterity can **be divided into three areas of research focus** (categories), which all adopt a slightly different perspective on organizational ambidexterity. Table 3 illustrates how these three focus areas approach the organizational ambidexterity phenomenon.

Focus area #1:	Focus area #2:	Focus area #3:
<p>Ambidexterity driven by organizational antecedents:</p> <ul style="list-style-type: none"> • Organizational structure • Behavioral context • Leadership processes <p>The focus is on <i>how</i> firms can achieve ambidexterity by using various organizational antecedents.</p>	<p>Ambidexterity driven by organizational elements/functions:</p> <ul style="list-style-type: none"> • Organizational learning • Technical innovations • Organizational adaption • Organizational design • Strategic Management <p>The focus is on the firm’s <i>ability</i> to behave both exploitatively and exploratively while performing various organizational functions.</p>	<p>Ambidexterity driven by affected interrelations:</p> <ul style="list-style-type: none"> • Environment factors <ul style="list-style-type: none"> • Environmental dynamism • Competitive dynamics • Other moderators <ul style="list-style-type: none"> • Market orientation • Resource endowment • Firm scope <p>The focus is on how environment <u>factors</u> and other moderators <u>affect relationships</u> between organizational antecedents, organizational elements/functions and/or firm’s performance (e.g. growth, market share or profitability).</p>

Table 3. Three research focus areas of organizational ambidexterity (adjusted from Raisch and Birkenshaw, 2008)

Focus area #1 studies *how* firms can achieve ambidexterity. It studies organizational antecedents, such as organizational structures, behavioural contexts and leadership processes, as promoters of organizational ambidexterity. **Focus area #2** examines the firm’s ability to both exploit and explore while performing various organizational activities. These activities include organizational learning (routinized vs. innovative), technical innovating (incremental vs. radical), organizational design (efficiency vs. flexibility), organizational adaption (stability vs. transformation) and strategic management (incremental vs. radical). **Focus area #3** studies the relationship between various aspects of ambidexterity. It demonstrates how environmental factors and other moderators affect organizational antecedents, organizational ambidexterity elements and firm’s performance (such as growth, market share and profitability). Table 4 lists some examples of these three focus areas.

Focus area:	Example:	Focus:
Focus area #1	Adler et al., 1999.	Focusing on how organizations achieve organizational ambidexterity in the Toyota case where exploration and exploitation coexisted in product development and production processes.
	Siggelkow and Levinthal, 2003.	Focusing on how organizations achieve organizational ambidexterity by recommending that firms should temporarily cycle through periods of exploitation and periods of exploration.
	Kowalczyk and Buxmann, 2015.	Focusing on how organizations achieve organizational ambidexterity when rigor and agility coexist in their business intelligence and analytics processes.
Focus area #2	Kalgoras et al., 2014.	Focusing on CIO’s challenges of creating an ambidextrous IS Function.
	Wu and Wu, 2016.	Focusing on how to achieve product ambidexterity while developing products.
Focus area #3	Kyriakopoulos and Moorman, 2004.	Focusing on market orientation and how firms’ ambidextrous orientation <i>without</i> a strong market orientation, display a significant reduction in new product financial performance.
	Auh and Menguc, 2005.	Focusing on firms’ balance between exploitation and exploration when faced with increasing environmental competitiveness.
	Chi et al., 2017.	Focusing on firms’ balance between IT flexibility and IT standardization when targeting to achieve higher performance in outsourcing relationships.

Table 4. Examples of organizational ambidexterity studies.

2.3.2. Selected approach to studying ambidexterity

As this dissertation aims to understand **how** an organization (its units and members) can become ambidextrous (in order to both exploit the current business model and explore the new digital business model), **the dissertation clearly belongs to Focus area #1**. Focus area #1, which studies the ambidexterity driven by antecedents (see Table 3), features in the individual research articles as follows.

Article I focuses on explaining *how* the current steering practices inhibit IT organizations in becoming ambidextrous. Article II explains *how* CIOs can motivate IT organizations to behave ambidextrously, with the help of new leadership principles and traditional metric-driven techniques (using the new dualistic CIO toolbox). Article III describes the entire process of *how* one selected case-study company (via re-structuring its organizational roles and working practices) creates an organizational environment where the organization is able to both exploit

the current business model and explore the new one (in other words, the case-study company creates an ambidextrous organizational environment).

The reasons why this dissertation does not belong to the other two focus areas are as follows. Firstly, while organizational learning has a central role throughout the dissertation, the project does not try to address the Focus area #2 question on *the firm's ability* to perform exploitative and explorative organizational learning simultaneously. Rather, organizational learning is studied in the dissertation in terms of *how* IT departments can become ambidextrous via innovative and experimental learning. Secondly, even though the environmental factor of Focus area #3 features in this dissertation (see Table 3) in the form of a digital business transformation, which causes environmental dynamism and motivates organizational ambidexterity, this dissertation does not answer the Focus area #3 question of how various ambidexterity elements relate to each other.

3. Methodology

This section defines the research methodology used in this dissertation. Section 3.1 describes the integrated framework for understanding social phenomena, and Section 3.2 explains how the dissertation is linked to this framework. Sections 3.3–3.4 describe the selected research design and the data design methods used in this dissertation.

3.1. Integrated framework for understanding social phenomena

“Dissertations can be divided into two general classifications based upon their purpose: (a) inquiry-oriented studies that have as their purpose to find out something about the problem and (b) action-oriented studies that have as their purpose to bring about change or improvement in the area of the problem” (Dissertation Manual, 2013, p.8).

According to Novak (1964, p. 25), *“Scientific inquiry is a way of life — an attitude. It is the modus operandi of the investigator in the world of natural or even unnatural events”*. Kyle (1980, p.123) continues that *“scientific inquiry will be defined as a systematic and investigative performance ability which incorporates unrestrained inductive thinking capabilities after a person has acquired a broad, critical knowledge of the particular subject matter through formal learning processes”*. So, inquiry involves activity and skills, but the focus is on the active search for knowledge or understanding to satisfy a curiosity (EricDigest, 1993), whereas an action-oriented study is *“simply a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out”* (Carr and Kemmis, 1986, p. 162).

This dissertation is considered to be ***an inquiry-oriented study*** in the field of IS (Information Systems) science, as the purpose of this dissertation is to find new angles on how the digital business transformation affects organizations. In IS science, as in the social sciences in general, the researcher tries to find out how and why social phenomena behave certain ways, and the consequences of this behaviour. In this dissertation, the question would be, for example, how

companies should successfully manage the consequences of the digital business transformation. In other words, the purpose of this inquiry-oriented dissertation is to prepare firms for the digital business transformation via reasonably explaining, and hence answering, the dissertation-level research question: ***“How should companies re-organize themselves (that is hybrid organize their roles, practices and behaviour) during the digital business transformation in order to behave both exploitatively (to assure productivity of the existing business model) and exploratively (to further develop the new digital business model)?”***

Once the social science researcher has selected the type of research to be conducted (e.g. an inquiry- or action-oriented study), the next step is to decide the methods for both *research design* and *data design* (see Sections 3.3–3.4). Choosing the right research and data design methods starts by considering the following aspects: (1) the researcher’s own role in the study, and (2) how the selected role positioning will affect the choice of design methods. Lee (1991) constructed a framework to clarify these role-related aspects (see Figure 3, adapted from Lee, 1991, p.351).

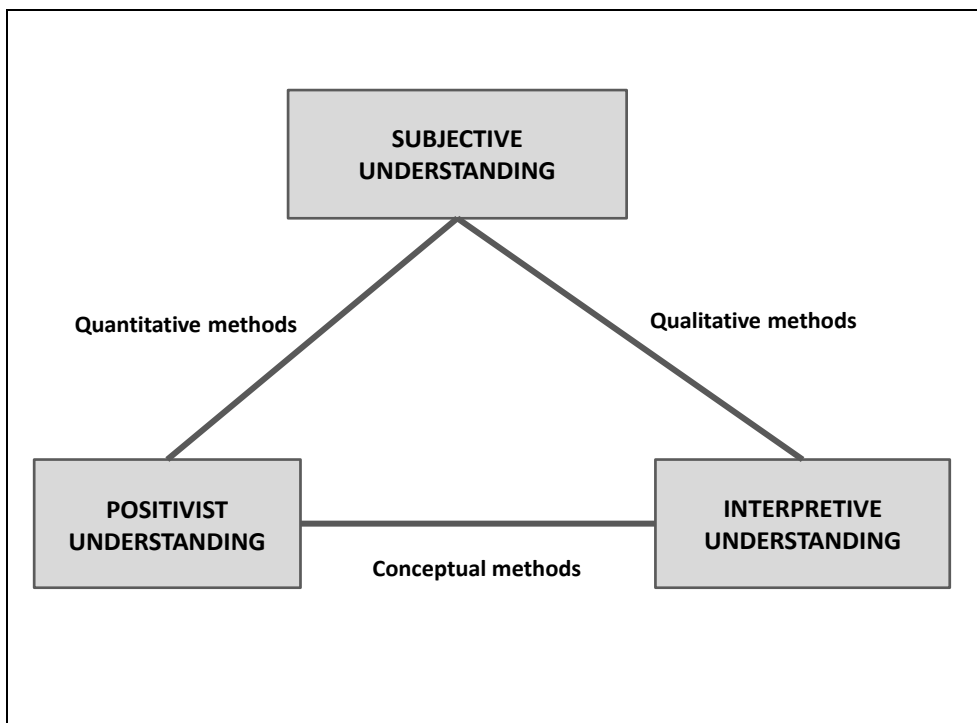


Figure 3. The integrated framework for understanding social phenomena (adapted from Lee, 1991, p.351).

The researcher’s understanding of a social phenomenon defines his/her role in the study. The researcher’s understanding can be divided into three knowledge categories (paradigms): subjective, interpretive and positivist understanding. **Subjective understanding** consists of how human subjects (including the researcher) make sense of themselves and their socially constructed surroundings, such as the organizational world (Lee, 1991). Subjectivism specifies structures, such as meanings and norms (Bijker, 1995), but it does not explain *how* structures shape (or constrain) people’s actions, or how some people have more power than others over

these structures (Cunha, 2013). With an *interpretive understanding*, the researcher has an *observant role*, and it is the researcher's own understanding and interpretation of a social phenomenon that constructs the research results (Lee, 1991). Orlikowski and Baroudi (1991) explain that interpretivism believes that our knowledge of reality is a social construction and, hence, must be understood as *dependent* on social actors. A *positivist understanding* consists of theoretical propositions, which are based on the rules of formal logic or hypothetico-deductive logic (Lee, 1991). "*Positivism is the view that the only authentic knowledge is scientific knowledge, and that such knowledge can only come from positive affirmation of theories through strict scientific method*" (Mastin, 2008). The researcher's role is seen as irrelevant (a researcher *independent* approach), meaning that the researcher could be replaced with another researcher but the scientific results would still be the same.

The three knowledge categories described by Lee (1991) are linked in the following ways. Subjective understanding has its foundation in positivist understanding (e.g. in the form of statistics or experimental results) and, at the same time, provides a foundation for the interpretive understanding, which in turn provides a foundation for the positivist understanding (Lee, 1991). The integrated framework for understanding social phenomena (see Figure 3) can also be used to group research projects into the following three categories, according to their own specific research methods.

- (1) Research projects which utilize *qualitative research* methods and have both subjective and interpretive understandings. Qualitative research methods involve "*the use of qualitative data, such as interviews, documents and participant observation, to understand and explain social phenomena*" (Myers, 1997, p. 241).
- (2) Research projects which utilize *quantitative research* methods and have both subjectivist and positivist understandings. Quantitative research methods include mathematical analysis, statistical methods and experimental designs (Lee, 1991).
- (3) Research projects which utilize *conceptual research* methods, and have both interpretivist and positivist understandings. Conceptual research methods include techniques for building *conceptual frameworks, models or processes*, which are composed of various concepts. According to Ravitch and Riggan (2016), conceptual frameworks (models) broadly include not only the relevant theoretical literature, but also the empirical findings of prior research and the researcher's own experiential knowledge, beliefs, commitments and values. These conceptual frameworks help people to understand, or simulate, the subject that the model represents.

The research methods selected for use in this dissertation are discussed in Section 3.2.

3.2. Positioning the dissertation in Lee's integrated framework

The integrated framework for understanding social phenomena (see Figure 3) includes three different methods, which the researcher can use to conduct her/his study. In this dissertation, both conceptual and qualitative research methods were used.

In both Articles I and II, conceptual research methods were used to construct *conceptual frameworks*. The conceptual framework constructed in Article I (the KPI category framework, see

Table 7) was created to help scholars and practitioners understand how traditional metric-driven steering practices function, and why these practices are therefore not suitable to motivate organizations (such as IT organizations) to behave ambidextrously. The conceptual framework constructed in Article I (the KPI category framework) was further expanded in Article II to include steering techniques called leadership principles. This expanded conceptual framework (the dualistic CIO toolbox, see Table 9) was constructed to help CIOs motivate their IT organizations to behave ambidextrously. Both Articles I and II conducted systematic mapping exercises (positivist) and interpreted the results according to the effect on the IT organization's ambidextrous behaviour (interpretivist).

Article III, in turn, used *qualitative research methods* to study the social phenomenon of hybrid organizing. The employees in the case-study company were interviewed, the various documents and webinars produced by the case-study company were studied (interpretivism) and the opinions of some employees were also directly used (subjectivism). For more on the research design and data design methods used in this dissertation, refer to Sections 3.3–3.4.

3.3. The research design of the dissertation

“Social research design needs a design or a structure before data collection or analysis can commence” (de Vaus, 2001, p.9). *“In other words, when designing research we need to ask: given this research question (or theory), what type of evidence is needed to answer the question (or test the theory) in a convincing way?”* (de Vaus, 2001, p.9). Therefore, **the research design** clarifies how the researcher constructs a study or an experiment.

The research design consists of several different components, which need to be decided on before starting to collect the initial research data. These design components are: (A) unit of analysis, (B) research phenomenon, (C) research context, (D) research environment and (E) research question/goal. The way in which these research components are used in this dissertation is explained below and summarized in Table 5.

- (A) **The units of analysis** selected for study in this dissertation (in all three articles) include various organizational roles that are being affected by the digital business transformation. The individual role of Chief Information Officer (CIO) is studied in Articles I–II, whereas the employee role is studied in Article III. Different organizational unit roles are studied in Articles I–II (which focus on the IT unit role) and also in Article III (which focuses on IT, business and production unit roles). It was natural to study organizational roles on *different organizational levels*, because these levels are strongly linked together. The team-level ambidexterity is steered by the senior managers (Jansen et al., 2008), and the ambidexterity manifests itself in the specific actions of individuals throughout the organization (Gibson and Birkinshaw, 2004). Therefore, the manager's ability (such as the CIO's ability) to combine both exploration and exploitation shapes the ambidextrous behaviour at the organizational unit level, as well as the individual employee level.
- (B) **The research phenomena** studied in this dissertation include organizational ambidexterity (Articles I and II) and hybrid organizing (Article III).

- (C) **The research contexts** studied in this dissertation include, in Articles I–II, the CIO’s steering practices, the CIO role and the IT organization role under transformation, and, in Article III, the working practices and various organizational roles under transformation.
- (D) **The case-study environments** of the dissertation are the IT (service) management environment in Articles I–II, and the company-wide digital implementation program environment in Article III.
- (E) Each of the articles provide answers to **the overall research question** of this dissertation: *“How should companies re-organize themselves (that is, hybrid organize their roles, practices and behaviour) during the digital business transformation, in order to behave both exploitatively (to assure productivity of the existing business model) and exploratively (to further develop the new digital business model)?”* Article I answers the question: “What kinds of organizational learning abilities do the ITIL metrics measure and how does the use of these learning abilities affect the digital business transformation?” In other words, Article I states the current challenges of using today’s metric-driven steering practices, such as the widely used performance metrics of ITIL v.2011 – Information Technology Infrastructure Library (ITIL Wiki, 2016a) – to motivate organizations to behave ambidextrously. Article II answers the question: *“What kinds of steering practices do CIOs need during the digital business transformation to motivate their IT organizations to behave both exploitatively and exploratively?”* Article II therefore provides an understanding of what is needed to steer organizations towards ambidexterity. The goal of Article III is: “To understand how introducing a new digital technology into the organizational context propagates a new business model opportunity that requires hybrid organizing. Case: Robotic Process Automation Technology”. Article III therefore states how companies should hybrid organize their working practices and organizational roles to create ambidextrous organizational environments, where both exploitative and explorative business models can be managed simultaneously.

Research design components:	Article I:	Article II:	Article III:
A: Unit of analysis	IT organization	Chief Information Officer	Organizational members and units
B: Research phenomenon	Organizational ambidexterity	Organizational ambidexterity	Hybrid organizing
C: Research context	The CIO’s steering practices, the CIO role and the IT unit role under transformation	The CIO’s steering practices, the CIO role and the IT unit role under transformation	The working practices and various organizational roles under transformation
D: Case environment	IT (Service) Management environment	IT (Service) Management environment	The company-wide digital implementation program environment
E: Research question/ goal	“What kinds of organizational learning abilities do the ITIL metrics measure and how does the use of these learning abilities affect the digital business transformation?”	“What kinds of steering practices do CIOs need during the digital business transformation to motivate their IT organizations to behave both exploitatively and exploratively?”	“To understand how a new digital technology propagates a new business model opportunity requiring the hybrid organizing. Case: Robotic Process Automation – technology.”

Table 5. The research design components.

3.4. Data design of the dissertation

While Articles I and II may be categorized as conceptual (theoretical) research papers, Article III is classified as a qualitative (empirical) research paper. The data design methodology (including data collection and analysis methods, selection of data type, length of data collection period and assurance of data reliability and validity) varies between conceptual and qualitative research. The following section explains *the data design* methods used in Articles I–III.

Data collection and analysis methods: Both Articles I and II use the same data gathering and analysis methods to construct the conceptual frameworks. The systematic concept analysis method of Nuopponen (2010) was used as a means to *select* the learning concepts within the chosen organizational learning theory of Argyris and Schön (1974). The concept derivation method of Walker and Avant (2011) was then used to *convert* these selected learning concepts to the IT context, to be used as building blocks for constructing conceptual frameworks.

The conceptual framework (the KPI category framework, see Table 7) constructed in Article I consists of four metric categories to measure various organizational learning abilities, such as the organization's ability to behave efficiently, accurately and innovatively. The constructed framework was then used as a conceptual (theoretical) lens to demonstrate why ITIL metrics, when applied to IT organizations, only motivate routinized (exploitative) behaviour and not innovative (explorative) behaviour.

Article II further expands the conceptual framework constructed in Article I by adding a set of new leadership principles to the framework. The constructed framework (the dualistic CIO toolbox, see Table 9) was tested using a hypothetical case example, to demonstrate the different challenging organizational situations that CIOs could solve using the new dualistic CIO toolbox.

The data gathering methods used in Article III consisted of employee interviews conducted in the case-study company, as well as various webinars and documents produced by the case-study company. The data was then analysed using peer reviews, and the validity of the results was assured by allowing key people in the case-study company to read and comment on the interpreted findings.

Data type (primary/secondary): As both Articles I and II are conceptual papers, primary or secondary data was not used to construct conceptual frameworks, but various learning concepts were derived from the organizational learning theory of Argyris and Schön (1974). Article I, however, used a publicly available secondary data source, the ITIL v.2011 (ITIL Wiki, 2016a), to test the usability of the constructed framework (the KPI category framework). The idea was to use the constructed KPI category framework as a lens to demonstrate the ITIL metric library's inability to steer IT organizations towards ambidexterity. The ITIL metric library was chosen because it has achieved an almost institutionalized position among CIOs looking to steer their IT organizations. Article III used both primary and secondary data. Primary data was collected via employee interviews (conducted in the case-study company), and different documents and webinars (produced by the case-study company) were used as a secondary data source.

Data collection period: The timescale for collecting data for qualitative or quantitative research purposes can be either longitudinal (carried out over a longer period of time, in order to study changes in the phenomenon) or cross-sectional (studying the phenomenon at one point in time) (RMKB, 2006). As both the cross-sectional and longitudinal studies are observational (IWH, 2015), and Articles I and II are conceptual rather than observational studies, determining the data collection period for these articles is irrelevant. Article III can be considered a cross-sectional study, as all the employee interviews were conducted and analysed over the period of one year.

Data reliability: “A reliable measure is one that gives the same “reading” when used on repeated occasions” (de Vaus, 2001, p.30). In qualitative research, the reliability of interview data can be assured by asking several interviewees the same questions, to cross-check the reliability of the answers. In conceptual research, the various concepts used as “building blocks” in the conceptual frameworks need to be empirically verified and well tested, preferably on several occasions over a longer period of time.

Both Articles I and II used learning concepts developed Argyris and Schön (1974), which have been empirically tested over several decades in many different case-study companies. This increased **the reliability** of these learning concepts and assured that they could be used (after a conversion process) as building blocks to construct new conceptual frameworks. The data reliability of Article III was, in turn, assured by using multiple sources of evidence: (1) the interview results were cross-checked by interviewing several people on the same subjects, (2) the interview results were also compared against documented information available in guidelines, webinars and minutes from meetings, and (3) the interpretations of interview results were peer reviewed and, if still found unclear, discussed again with the interviewees.

Data validity: There are three basic ways of assessing data validity (de Vaus, 2001). These are: (1) **criterion validity**; if a criterion (or scale) is used in the research, the data validity increases when the selected criterion is comparable with another criterion used earlier by other researchers, (2) **content validity**; which defines how well the collected data fits the research purposes, and (3) **construct validity**; which defines how well the results fit the theoretical expectations (hypothesis), by either confirming the expectations or not. This dissertation uses the *content validity* method in all three articles. This is because none of the articles use criteria (scales) or hypotheses, which would require using the criterion or construct validity methods.

The data content validity of the constructed conceptual frameworks in Articles I and II was ensured (a) by using the systematic concept analysis method of Nuopponen (2010) to select the best available literature domain, which would describe both innovative and routinized types of learning abilities at the organizational level (and not, for example, at the individual level); (b) by using the concept derivation method of Walker and Avant (2011) to convert these selected learning concepts to the IT context; and (c) by conducting several rounds of peer review to discuss the validity of the selected (and converted) learning concepts. The data content validity in Article III was assured by using semi-structured interview guides, asking open (not leading) questions in the interviews and letting people talk openly, but most of all by promising interviewees that the interview results would be handled anonymously (and not narrated, for example, to colleagues or supervisors).

4. Summaries of the original research articles

4.1. Summary of Article I: Specifying CIOs' current steering practice challenges

Article I is classified as a conceptual paper which criticizes the suitability of the CIO's current metric-driven steering techniques. The summary of Article I is illustrated in Table 6.

Title:	Research question/goal:	Method:	Theoretical lens used:	Results:	Outlet:
"Do KPIs used by CIOs Decelerate Digital Business Transformation ? -The Case of ITIL-"	"What kinds of organizational learning abilities do the ITIL KPIs measure and how does the use of these learning abilities affect the digital business transformation?"	Conceptual research, case Metric library: ITIL	Organizational learning theory of Argyris and Schön (1974) with single- and double-loop learning methods.	ITIL KPIs when used to steer IT organizations decreases IT organizations innovative behaviour and hence decelerates in the digital business transformation	Digit 2016 (pre-conference for ICIS)

Table 6. The brief summary of Article I.

To succeed in the digital business transformation, CIOs must ensure that their IT Service Management (ITSM^(*)) organizations (or IT organizations for short) will learn to question (and alter) existing ways of working, experiment with new practices and, most of all, learn how to implement these changes into the ITSM environment, in collaboration with other organizational units. Therefore, Article I assesses whether the most commonly used metric-driven steering techniques among CIOs motivate IT organizations (their own or outsourced) to behave innovatively in the digital business transformation.

(*) **IT Service Management (ITSM)** refers to the entirety of activities – “directed by policies and structured and organized by processes and supporting practices – that are performed by an organization to plan, deliver, operate and control IT services offered to customers (FitSM Standards Committee, 2016).

One of the most commonly used metric-driven steering techniques is based on Key Performance Indicators (KPIs) embedded in Information Technology Infrastructure Library, or ITIL^(**) (ITIL Wiki, 2016a).

(**) **Information Technology Infrastructure Library (ITIL® 2011)** was originally developed by the UK Government's Central Computer and Telecommunications Agency (CCTA), as part of a suite of best-practice publications for IT Service Management (ITSM) (ITIL Wiki, 2016b). “*The objective of the IT Infrastructure Library was to develop effective and efficient methods for the provision of IT services - in other words a catalogue of best practices for the IT organization, which today is known as ITIL®*” (ITIL Wiki, 2016b). Currently, ITIL includes 97 KPIs measuring five different process groups, each of which corresponds to a specific service lifecycle stage in the ITSM environment.

The primary objective of Article I is therefore to contribute to IS research in the areas of organizational learning, performance management and organizational role studies (on the CIO and the IT unit) by setting the following research question: “*What kinds of organizational learning abilities do the ITIL KPIs measure and how does the use of these learning abilities affect the digital business transformation?*” The research strategy included a two-phased methodology to construct a KPI category framework (see Table 7). The framework included KPI categories, which could be used to measure the organization’s different learning abilities. In Phase 1, the systematic concept analysis method of Nuopponen (2010) was used to select and describe a set of learning concepts (single- and double-loop learning) derived from the theory of Argyris and Schön (1974). In Phase 2, the selected learning concepts were converted to the IT context (as the CIO’s operational targets) using the concept derivation method of Walker and Avant (2011). The constructed KPI category framework was then used as a mapping tool to demonstrate which learning abilities (routinized or innovative) the ITIL KPIs actually measure. Finally, the goal setting theory of Locke and Latham (2002) was used to analyse how the ITIL KPIs influence the IT organizations’ learning behaviour, and how this affects the success of the digital business transformation.

Translated KPI categories:
<p>Correction-target (measurement type #1): Measurements which measure the amount of corrections made to fix the deviations in the existing ITSM environment without changing the current organizational targets.⁽¹⁾</p>
<p>Stable-effectiveness-target (measurement type #2): Measurements which measure the amount of completed actions or achieved results to assure the stability and/or effectiveness of the existing ITSM environment without changing the current organizational targets.⁽¹⁾</p> <p>Note: The actions being measured can also include pre-activities such as reviews or simulations, whose aim is to assure the stability and/or effectiveness. The measurement can also measure anti-effectiveness or anti-stability (violations). The measurement differs from Correction-target since it does not measure the corrections completed, but actions <i>assuring</i> effectiveness and/or stability.</p>
<p>Improvement-target (measurement type #3): Measurements which measure the amount of improvement proposals to increase the effectiveness and/or stability of the existing ITSM environment without changing the current organizational targets.⁽¹⁾</p>
<p>Innovation-target (measurement type #4): Measurements which measure the amount of innovation proposals (new processes, services, products etc.) to be implemented in the ITSM environment without obeying the current organizational targets.⁽¹⁾</p>
<p>(1) <i>Current organizational targets (governing values) include any existing organizational goals, norms, or limitations assigned to processes, routines, structures, plans, services, products, projects, or artefacts in the existing ITSM environment.</i></p>

Table 7. The KPI category framework (a conceptual framework).

The results of mapping all 97 ITIL KPIs against the constructed KPI category framework demonstrate that 96.4% of the current ITIL metrics measure exploitative routinized behaviour (such as the organization’s effectiveness and accuracy), and only 3.6% measure explorative behaviour (such as inventing new products, services or working practices). Therefore, according to the goal setting theory of Locke and Latham (2002), using the KPI library of ITIL to steer the IT organization will not motivate the IT organization to behave innovatively (to use their double-loop

learning abilities), but instead enforces the IT organization’s single-loop type of routinized behaviour. The accurate results of ITIL KPI mappings are shown in Figure 4.

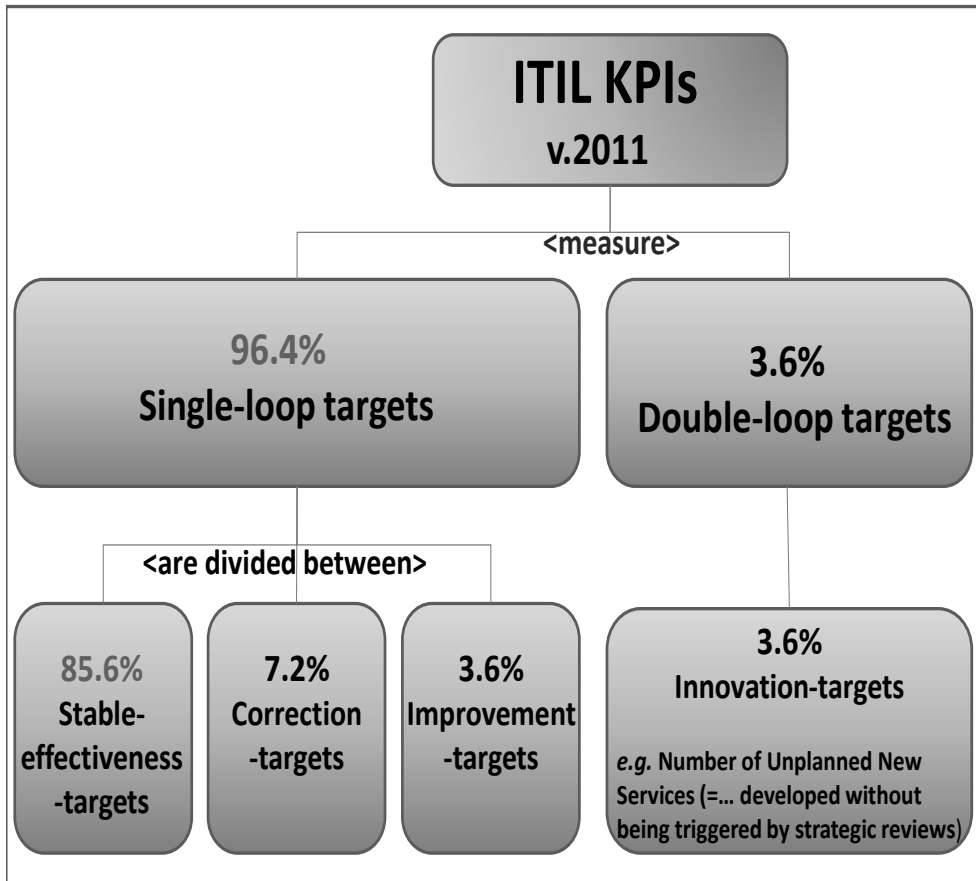


Figure 4. The mapping results of the ITIL KPIs.

To summarize, Article I addresses the dissertation-level research question by demonstrating how the traditional metric-driven steering practices (such as the KPI library of ITIL), when used to steer IT organizations, will only degenerate the digital business transformation. As metric-driven steering practices mainly measure the organization’s single-loop (specific, routinized) learning abilities (i.e. the organization’s ability to maintain the efficiency, stability and accuracy of their existing ITSM environment), these steering mechanisms do not motivate organizations to behave innovatively or experimentally. This is because experimenting with new practices or technologies would only jeopardize the assigned single-loop specific goals that the organization is measured against, namely ensuring the efficiency, stability and accuracy of the existing ITSM environment.

4.2. Summary of Article II: Providing new steering practices for CIOs

Article II is classified as a conceptual paper. It constructs a new CIO tool to steer the IT organization towards ambidexterity. A summary of Article II is illustrated in Table 8.

Title:	Research question/goal:	Method:	Theoretical lens used:	Results:	Outlet:
“A New Dualistic CIO Toolbox: Towards Ambidexterity in the Digital Business Transformation”	“What kinds of steering practices do CIOs need during the digital business transformation to motivate their IT organizations to behave both exploitatively and exploratively?”	Conceptual research	Organizational learning theory of Argyris and Schön (1974) with Single-, Double-, and Triple-loop learning methods.	A new CIO’s steering tool (the dualistic CIO toolbox) to motivate IT organizations to behave both routinized and innovatively (ambidextrous behaviour)	CAPSI2017 (pre-conference for ECIS)

Table 8. The brief summary of Article II.

Article II may be considered a continuation of Article I, as it expands the conceptual framework of Article I (the KPI category framework, see Table 7) by introducing new leadership techniques (leadership principle categories) into the framework. The expanded conceptual framework (the dualistic CIO toolbox, see Table 9) can be used by CIOs (and other managers) to motivate their IT organizations to behave both exploitatively and exploratively (ambidextrously).

Hence, the primary research objective of Article II is to support CIOs and the IT organizations in their new ambidextrous roles, by answering the following research question: *“What kinds of steering practices do CIOs need during the digital business transformation to motivate their IT organizations to behave both exploitatively and exploratively?”*

To answer the research question, a new dualistic management tool for CIOs was constructed. The methodology used to construct the tool was same as in Article I, and included two phases. In Phase 1, the systematic concept analysis method of Nuopponen (2010) was used to select and describe a set of learning concepts derived from the theory of Argyris and Schön (1974). The selected learning concepts included single-, double- and triple-loop learning methods, as well as Model II behavioural targets (behavioural principles). In Phase 2, the selected learning concepts were converted to the IT context (as the CIO’s operational targets and leadership principles) by using the concept derivation method of Walker and Avant (2011).

Table 9 illustrates the constructed dualistic CIO toolbox, with its exploitative operational targets and explorative leadership principles. To clarify how CIOs should use this new tool in practice, the authors created hypothetical case examples of diverse, challenging work situations. The idea was to demonstrate how CIOs could solve these challenging situations by using various operational targets and leadership principles described in the new dualistic CIO toolbox.

OPERATIONAL TARGETS / LEADERSHIP PRINCIPLES

(*) Organizational targets (governing values) include any existing organizational goals, norms or limitations assigned to processes, routines, structures, plans, services, products, projects or artefacts in the existing IT environment.

EXPLOITATIVE IT	<p>Correction-target: Measure the number of corrections made to fix the deviations in the existing IT environment without changing the current organizational targets^(*).</p>
	<p>Stable-effectiveness-target: Measure the number of completed actions or achieved results to assure the stability and/or effectiveness of the existing IT environment without changing the current organizational targets^(*). Note: The actions being measured can also be pre-activities such as tests, simulations, reviews, audits etc. to assure stability or effectiveness. The measurement can also measure anti-effectiveness or anti-stability (violating current organizational targets). The measurement differs from the Correction-target measurement since it does not measure the number of corrective actions, but instead actions assuring effectiveness or/and stability.</p>
	<p>Improvement-target: Measure the number of improvement proposals (related, e.g. to services, products, processes or artefacts) to increase the effectiveness and/or stability of the existing IT environment without changing the current organizational targets^(*).</p>
EXPLORATIVE IT	<p>Innovation-target: Measure the number of innovation proposals (new processes, services, products etc.) to be implemented into the IT environment without obeying the current organizational targets^(*). Note: Innovation proposals can also correct an existing deviation or failure in the IT environment.</p>
	<p>Conflict-principle: Arrange surveys or open discussions of conflicts between various relationships and collect ideas or solutions generated to correct these conflicts. Note: The idea is to collect information of the conflicts, e.g. among various departments escalated to a higher level because no common solution was found jointly. The ideas and solutions for correcting these conflicts are related to changing/re-prioritizing common organizational targets.</p>
	<p>Transparency-principle: Arrange surveys or open discussions of the current or future organizational targets and collect ideas or solutions generated through these surveys or discussions. Note: The idea is to ensure that current or future targets, e.g. for various departments fit together.</p>
	<p>Taboo-principle: Arrange surveys or open discussions the major organizational difficulties or taboos and collect the solutions, confirmations or refutations obtained during these surveys or discussions.</p>
	<p>Lessons-learned-principle: Arrange surveys or open discussions of the previous organizational targets or experiences and collect lessons learned obtained through these surveys or discussions. Note: The idea is to collect lessons learned to evaluate, e.g. whether experiences (related to projects, processes, services, etc.) could be used to create future organizational strategies, policies or structures.</p>
	<p>Expertise-principle: Arrange surveys or open discussions of the expert role to ensure that the valuable expert knowledge is available to various decision-making networks.</p>
	<p>Prediction-principle: Arrange surveys or open discussions to collect information of tests or simulations of any type of solutions and valid test results (positive or negative) obtained during these experiments to explore possible impacts in advance. Note: The solution can be any type of application, plan, forecast, estimate, verification, etc. related to projects, processes, policies, structures, services, products or artefacts.</p>
	<p>Data-access-principle: Arrange surveys or open discussions of events or actions that failed owing to restricted access to valid information in the organization at the time information was required. Note: The failure happened when events or actions could not be implemented correctly, not at all or needed later to be changed.</p>
	<p>Decision-follow-up-principle: Arrange surveys or open discussions of decision-making practices to ensure the consequences of decisions are followed up by decision makers (and corrected if necessary). Note: The decision maker is any organizational member, who is responsible for the decision.</p>

Table 9. The dualistic CIO toolbox (to steer IT organizations towards ambidexterity).

To summarize, Article II contributes to the dissertation-level question by introducing a set of new leadership principles (techniques) to supplement the current metric-driven steering practices (such as the ITIL KPIs). The constructed ambidextrous steering framework – the dualistic CIO toolbox – can be used by CIOs (and other managers) to motivate organizations to behave ambidextrously (both exploitatively and exploratively). Exploitative behaviour is needed to exploit the services, products and practices provided by the current business environment, and can be achieved by rewarding the organization based on their routinized, single-loop type of behaviour. Explorative behaviour, in turn, is needed to invent and experiment with the new services, products and practices enabled by the new digital technologies, and can be achieved by motivating the organization to use their double- and triple-loop learning skills, specifically for questioning, experimenting and innovating.

4.3. Summary of Article III: Extending Internal RPA adoption to Offering Services for Clients: Journey of OpusCapita

Article III is classified as a qualitative research paper. It uses the *hybrid organizing* lens to study organizational changes in a selected case-study company during and after the implementation of a new digital technology called Robotic Process Automation (RPA*). The article proposes that RPA should be treated as an opportunity rather than a threat. A summary of Article III is illustrated in Table 10.

Title:	Research question/goal:	Method:	Theoretical lens used:	Results:	Outlet:
“Extending Internal RPA adoption to Offering Services for Clients: Journey of OpusCapita”	“To understand how a new digital technology propagates a new business model opportunity requiring the hybrid organizing. Case: Robotic Process Automation – technology.”	Qualitative research, case RPA implementation and adoption of a new business model in a case company	Hybrid organizing (Battilana and Lee, 2014)	Lessons-learned for the BPO suppliers (a) building up RPA capabilities and (b) successfully adopting a new digital business model (by combing attained digital knowledge, existing outsourcing skills and skills to hybrid organize)	Accepted (28.4.17 by Prof. Lacity) to be published in MIS Quarterly Executive

Table 10. The brief summary of Article III.

Article III starts by explaining how the Business Process Outsourcing (BPO) supplier (the case-study company) builds its RPA capabilities to streamline its BPO processes in the area of payroll management. Article III then describes how growing customer interest in RPA technology offers the case-study company the possibility of creating a new digital business model. To build a new digital business model, the case-study company uses both its new RPA knowledge and its existing outsourcing capabilities. RPA knowledge is needed to tailor the customer processes and outsourcing capabilities for operation, to secure and maintain the robotic farms, and to provide customer training and support. Article III continues by explaining how the case-study company

needs to re-arrange its organizational roles and practices to manage both its business models (the new digital business model and the traditional outsourcing business model) simultaneously.

The organizational re-adjustments are part of the case-study company's hybrid organizing activities. These activities include, for example:

- a. The partition of the payroll employee role. The role is divided into two sub-roles. A new supporting exploitative sub-role is created to be performed by robots, whereas human payroll employees will focus more on customer-related work and also assure that the new payroll assistants (software robots) will function as planned. Additionally, some of the business professionals will step into the highly explorative role of change agents, to promote the use of the robots and identify new processes where software robots can be utilized.
- b. The modification of the strict organizational unit roles. For example, the IT unit is encouraged to collaborate with other organizational units to continuously improve the firm's current automation technology base (e.g. by introducing machine learning). Additionally, the RPA team is divided into two groups, where one group will support the new digital business model by serving external customers, and the other group will concentrate on streamlining existing BPO processes.
- c. The partition of the working practices. The working practices (in the observed payroll process area) are divided into exploitative tasks, to be performed by software robots, and explorative tasks, when the work requires human-to-human collaboration or the ability to innovate.

(* The term Robotic Process Automation (RPA) means *"configuring the software to do the work previously done by people"* (Lacity and Willcocks, 2016, p.22). The RPA technology (also called as the software robotics) has evolved from the automation of repetitive tasks of a single user to a platform based application that is capable of automating complex business rules and orchestrating hundreds of software robots to address large volumes of work.

The software robots mimic the way humans perform tasks and they can log into the systems using their own usernames, interpret text, tables and figures, move and click a mouse, write emails, fill application forms, quality check and correct data in various systems.

Based on analysis of 23 interviews and additional secondary data, Article III provides guidance for the BPO suppliers on how to treat RPA as an opportunity rather than a threat. The lessons learned are divided into two categories. The first category guides the BPO suppliers on how to improve their digital know-how. The second category guides the BPO suppliers on how to build and adopt a new digital business model, using the attained digital know-how, existing outsourcing skills and the ability to hybrid organize (see Table 11).

Lessons learned for the BPO suppliers: A. How to build internal RPA capabilities? B. How BPOs can build and adapt a new digital business model?	
“Lessons for internal RPA adoption”	
A1: Prepare the IT department and develop RPA capabilities	When implementing RPA internally, the IT department and the CIO need to be involved in possible supplier negotiations as well as in the development, testing and production phases of RPA implementations. Special care must be taken that the technical infrastructure (such as networks, server capacity) works well with the software robots. As the use of the robots becomes more widespread, IT assets in the form of reusable components should be identified to boost the utilization of RPA.
A2: Address concerns of losing jobs	The communication strategy needs to be developed to inform how the RPA adoptions will affect the jobs. Highly skilled business professionals need to be motivated because they are invaluable in the RPA implementation process when developing the rules for the robot. The management should communicate that, while generating employee savings, the RPA technology can also free personnel to more creative work.
A3: Select processes carefully and measure improvements	The BPO suppliers should select processes including rule-based tasks that are time consuming and/or have high transaction volumes to maximise the benefits of the RPA. To avoid that unforeseen problems can occur in large scale, it might be smart to limit the RPA trial to few users and only later to expand the amount of users. A baseline (such as the duration of an activity) should be established before the robot implementation and the resulting improvements measured against the baseline.
“Lessons-learnt for BPOs to build and adapt a new digital business model”	
B1: Use existing and new capabilities to offer RPA services to customers	The BPO suppliers should construct new digital services using elements of: (a) the new digital technologies (they already have experience of), (b) their existing service portfolio (such as server maintenance, security assurance, service desk support) and (c) listening carefully to the challenges the customers currently have with digitalization. The BPO suppliers should also remind themselves that they are in a fortunate situation, as they only need to respond to the existing customer demand, not to create the demand.
B2: Facilitate a hybrid organizational structure (re-organize roles and practices)	To be able to offer both the traditional outsourcing services and the RPA services the BPO suppliers need to facilitate a hybrid organizational structure. Although both business models would share highly standardized operational processes, such as service desk support, server operations and security management, the business models would have somewhat opposite business logics. In the traditional outsourcing business model the focus would still be to standardize whenever possible, whereas in the RPA service model there would be more customer specific tailoring involved. The BPO suppliers should re-structure their teams (and related work practices) to support both business models.
B3: Be willing to cannibalize sales from traditional BPO model while moving to a hybrid	The new RPA services are likely to cannibalise sales from traditional outsourcing products. However, the BPOs can expect a rapid expansion of the demand for the new RPA, which will make the new digital business model profitable. Thus, it is advised that the BPOs should be willing to cannibalize the sales from the traditional BPO model when moving to the new hybrid structure and expanding the new digital business model
B4: Be aware the pressures of lower service prices	If a BPO used RPA to automate their internal processes, customers could start demanding for lower prices to benefit from the lower cost of producing services, especially if the prices were negotiated based on FTEs (Full Time Equivalent). To manage the customers’ demands for lower prices for the RPA services, the BPO suppliers should communicate the investments made to adopt RPA to the clients, including investments in equipment, personnel and training, and to tie the service prices to the transaction volumes, rather than FTEs.

Table 11. Lessons-learnt for the BPO suppliers to treat the RPA technology as an opportunity to build and adopt a new digital business model.

To summarize, Article III contributes to the dissertation-level question by providing a successful example of hybrid organizing. Hybrid organizing (the re-structuring of organizational structures, roles and practices) is required in order to manage parallel business models during the digital business transformation. Article III also pinpoints that the company can recognize and create a new digital business model while it is learning to utilize a new digital technology. Hence, the creation of a new digital business model does not necessarily require a systematic plan, but can be realized “while the company is experimenting with a new digital technology”, as happened with the case-study company in Article III.

5. Discussion and conclusion

This dissertation has examined (a) how the digital business transformation enables firms to create new digital business models in parallel to their traditional ones, (b) how firms can manage these parallel business models by learning to hybrid organize their organizational practices and behavioural roles, and (c) how hybrid organizing creates ambidextrous organizational environments, where organizations are able to behave both exploitatively (to exploit the services, products and practices of their current business models) and exploratively (to invent new services, products and practices with their new digital business model). The research focus areas described above and their connections have been further illustrated in *the chain-reaction model of digital business transformation* (see Figure 1 in Section 1.3). As well as summarizes the logic of the entire dissertation, the chain-reaction model (Figure 1) has also served as a foundation to “derive” the dissertation-level research question: “*How should companies re-organize themselves (that is, hybrid organize their roles, practices and behaviour) during the digital business transformation, in order to behave both exploitatively (to assure productivity of the existing business model) and exploratively (to further develop the new digital business model)?*”

The following sections summarize the main findings of the dissertation (Section 5.1) and the most important implications of these findings (Section 5.2), discuss the theoretical and practical contributions of the dissertation (Sections 5.3), and address the limitations of the dissertation and the need for future research (Section 5.4).

5.1. Main findings of the dissertation

Based on my research findings (for Articles I–III), it has become evident that companies will go through a three-phase process when implementing the digital business transformation. Figure 5 illustrates this ***three-phase process flow***, including pre-, during- and post-digitalization phases.

The process model has been constructed using the main findings from Articles I–III (see Sections 4.1–4.3), arranged in sequential order according to which of the three digitalization phases they belong. By presenting the information in the process flow format, this improves the firms’ understanding of how and when they should perform various hybrid organizing activities during the digital business transformation.

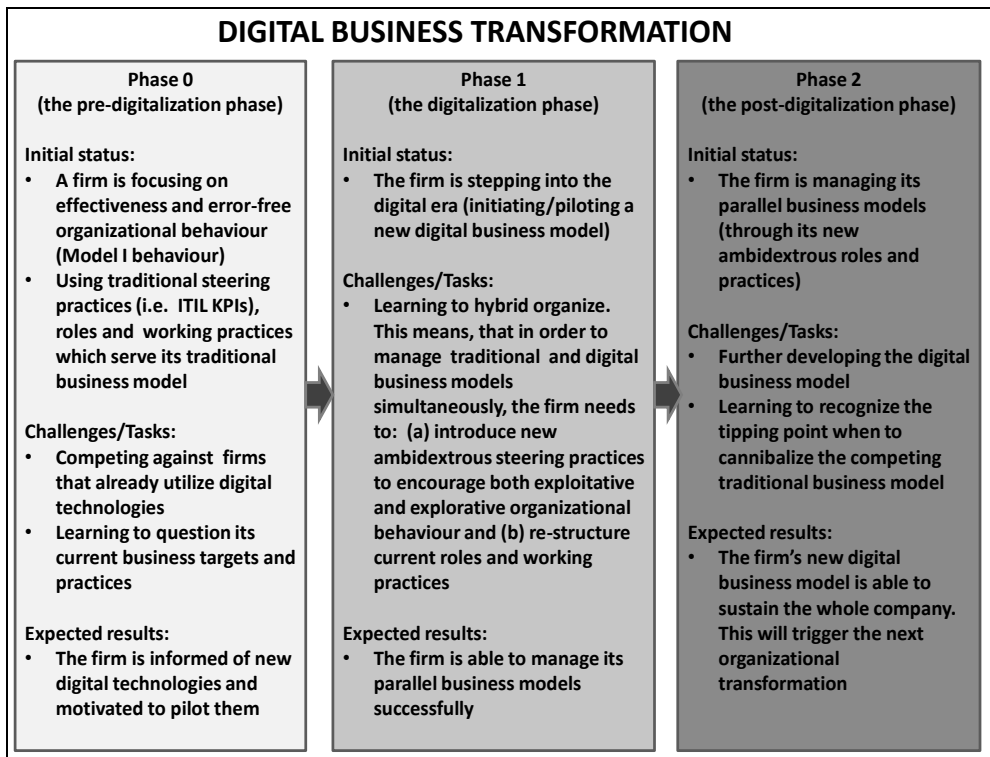


Figure 5. The three-phase process of the digital business transformation.

Phase 0 represents the current status of many organizations today. The firm in Phase 0 has well-established organizational roles with related working practices. These roles and working practices are likely to have been optimized over the years to serve the company's traditional business models. Additionally, the firm in Phase 0 still uses the traditional steering mechanisms (such as ITIL KPIs) to maintain the organization's exploitative behaviour, which means that the organization is encouraged to work effectively, accurately and to ensure the stability of their current working environment. In Phase 0, the organization also behaves according to Model I organizational principles (see Section 2.1.2). This means that the organization obeys the (given) organizational norms, targets and limitations, without questioning their validity or trying to change them. As the organization is not encouraged to question existing practices, nor is it motivated to experiment or innovate. This is because explorative behaviour requires the ability to question. Additionally, the organization may consider that experimenting with new techniques or working practices could jeopardize their chances of achieving their primary targets, namely their effectiveness, accuracy and stability targets (Model I-specific targets).

However, in the near future, the organization in Phase 0 will probably experience growing competition due to digitalization. This will strongly motivate these firms to move into Phase 1 (the digitalization phase). Stepping into the digital era, however, requires that an organization learns to question its current organizational targets, norms and practices. This will only be possible if the organization is motivated to behave innovatively.

In Phase 1, the organization will need to learn to experiment with new technologies and ways of working, in order to create new digital products and services in line with their new digital business model. Learning to experiment and innovate (explorative behaviour) requires changes in organizational behaviour. This will be possible if the organization can move from the Model I regulated organizational environment into the Model II consistent environment. In Model II, the organization is able to behave ambidextrously, meaning that the organization can continue to exploit their current services, products and practices, but also explore new digital services and ways of working. In other words, the organization is able to behave ambidextrously. Argyris (1977, p. 123) explains that *“it is not easy for people to move from Model I toward Model II”*, but this can be achieved. To enable this difficult organizational transition (from the Model I regulated environment to Model II), the company needs to learn how to hybrid organize.

Hybrid organizing (see Section 2.2.1 and Figure 1) is best started by bringing new types of steering practices into use. By introducing ambidextrous steering practices (such as the dualistic CIO toolbox presented in Table 9), the leadership can trigger and steer organizations through this difficult transition. Next, the other elements of hybrid organizing can be implemented, namely restructuring the organizational (behavioural) roles with related working practices. Only after fully completing the hybrid organizing process, the organization is capable of managing both their business models (digital and traditional) simultaneously. The firm, which has learned to manage parallel business models simultaneously, is ready to move into Phase 2 (the post-digitalization phase).

In Phase 2, the firm needs to continue developing its digital business model, but at the same time evaluate when to stop investing in the traditional business model. In Phase 2, the profit margins for the traditional business model will probably continue to decline, as a result of decreasing customer interest (customers are more interested in buying new digital services than traditional ones). Hence, in Phase 2, the firms should continuously measure the profitability of both their business models, in order to recognize in advance the forthcoming tipping point – when the income of the digital business model is able to sustain the whole company. The tipping point will enable the company to withdraw the competing traditional business model, which, in turn, will trigger new organizational re-arrangements. This means that some of the traditional organizational roles and practices will disappear along with the traditional business model, whereas the new organizational roles and practices that support the new digital business model will continue to increase in number. It is worth noting that also other scholars and practitioners have predicted similar major changes to current office professions and practices (Avent, 2016; World Economic Forum, 2016d).

5.2. Main implications of the research findings

The digital business transformation is likely (directly or indirectly) to result in many different consequences for the organizations. Several of these consequences have already been discussed in Articles I–III (Sections 4.1–4.3), and the five most important consequences are listed here.

Firstly, *hybrid organizing*, triggered by the digital business transformation, will be one of the main tasks for firms in the coming years. A report published by Forbes Insights (2016) supports this

claim. In a survey of 573 senior executives worldwide, half of the executives believe the next two years will be critical for their organizations in making the transition from old to new, and therefore the digital business transformation is high on the strategic agenda for these enterprises. The companies that have already, to some degree, digitalized their customer services or customer interfaces by allowing, for example, online shopping and mobile payments (Itälä, 2015), will probably also be more equipped to deploy other digital technologies (such as software robotics, sensor technologies, artificial intelligence and big data). The know-how achieved from deploying new technologies will be an advantage when planning and creating new digital business models. However, time will tell whether companies choose to convert their existing business models directly to digital ones, or rather create parallel digital business models (EY, 2016; Berman and Bell, 2011) and let both models exist over a period of time. *“Thus, organizations have to choose whether to digitally transform their existing businesses and gain from these technologies or yield to the disruptions of their organizational processes and traditional business models”* (Nwankpa and Roumani, 2016, p. 2).

Secondly, the roles of organizational units, employees and managers will undergo a transformation. Traditionally, the CIO has encouraged the IT organization (own or outsourced) to behave exploitatively by measuring and rewarding them based on their routinized single-loop type behaviours (exploitative skills), to ensure that the firm’s technology base will, at all times, be as effective, stable and accurate as possible. This has caused the IT organization to protect the firm’s technology base from any “unnecessary” changes (such as experimenting with new digital technologies), as this would only risk the stability, accuracy and effectiveness of the existing IT environment. However, in the digital business transformation, the IT organization cannot simply act as a traditional “gatekeeper” to protect the company’s technology base (Kettinger et al. 2011; Korhonen, 2015). Instead, the IT organization needs to start collaborating more with other organizational units (Collin, 2015; Chen and Wu, 2011). Explorative innovative behaviour, which has traditionally belonged to the business and production units, should also become a responsibility of the IT organization. Similarly, the task of assuring the functionality of the traditional business models should not only be the IT organization’s responsibility, but should be shared with other units as well. For example, the quality expectations and future development demands related to the traditional services and products should be down-prioritized by business units during the digital business transformation. This would allow more time for the IT organization to contribute to the digital business transformation.

Similarly, just as different organizational unit roles will change, so will different employee and manager roles, such as the CIO’s role (Peppard et al., 2011; Weill and Woerner, 2013a; Carter et al., 2011). Some of the employee roles will be divided into exploitative and explorative sub-roles, as happened with the payroll employee role in Article III. The routinized exploitative employee roles will increasingly be performed by armies of software robots, whereas explorative employee roles will be performed by humans (at least in the near future). Manager roles will either experience the same changes as the employee roles (i.e. roles will be divided into sub-roles), or will be expanded to truly become ambidextrous. The ambidextrous manager roles, however, will vary in the degree to which the roles focus on achieving exploitative and explorative goals.

Thirdly, working practices will change along with the changing organizational roles. Some working practices will stay the same, especially those which will require human-to-human interaction,

whereas others will be replaced by more effective digitally enabled practices. For instance, routinized working practices, which require a lot of concentration, detailed knowledge and which are repeated on a daily basis, will be increasingly performed by various digital technologies, such as robotic process automation (Casale, 2015; Willcocks et al. 2015; Lacity et al. 2015; Lacity and Willcocks, 2016; Deloitte, 2016; KPMG, 2016). Over time, all of the working practices will be divided into exploitative (routinized and repeatable) and explorative (innovative) working tasks, according to who will be performing the tasks (digital robots or human employees).

Fourthly, the traditional metric-driven steering practices will undergo a transformation. The majority of today's organizational metrics measure the organization's ability to achieve single-loop type targets (such as effectiveness, stability and accuracy). These metrics are actually inherited from the era of industrial manufacturing (the mid-18th to mid-19th century). During that time, workers moved from small workshops to large workplaces (factories). Controlling the behaviour of large workforces required the introduction of *a work discipline* (Hopkins, 1982). Factory managers used work disciplines to dictate how, when, and in what manner the work was to be completed. Additionally, a practitioner-scientist **Frederick Taylor** created in the 1880s a new management theory that specifically focused on increasing efficiency and eliminating waste (ASME, 2012). The enormous focus on effectiveness and the extensive use of these new work disciplines created organizational environments in which "the leadership knew better" and "the organization should never question the management's decisions".

Today's widely used metric-driven management practices still draw on Frederic Taylor's ideology and therefore this management style is often called New or Digital Taylorism (Parenti, 2001; Au, 2011). Digital Taylorism is based on the same questionable assumptions about the leadership's superiority and how the organization's only role is to assure an effective, accurate and stable production environment, which the organization would fully protect against any unnecessary changes or experiments. Indeed, the metric-driven steering practices, such as ITIL (see Section 4.1), directly prevent organizations from innovating and experimenting, as the organization would not want to jeopardize fulfilling the top-down targets by questioning the leadership's abilities.

Argyris and Schön (1974) described the organizational environment in which these kinds of top-down controlled steering practices still exist, and named it the Model I regulated (principled) environment (see Section 2.1). Unfortunately, many of today's organizations still function within Model I regulated environments and, hence, are not able to think of "out of the box solutions", which are needed during the digital business transformation.

Succeeding in the digital business transformation requires new types of steering practices that can motivate organizations to behave innovatively and experimentally. These new steering practices should not only focus on measuring the end results of established work, but instead should motivate organizations to question the validity of these established work practices, as well as the validity of the products and services that they are currently producing. Only then can the real digital business transformation start to happen. This is an important aspect to understand, as new ideas on how to use digital technologies will probably not come from the leadership, but rather from the people involved with producing, selling and maintaining the company's products and services. The more time these people have to experiment and innovate, the more successful the whole organization's journey through the digital business transformation will be. The dualistic CIO

toolbox created in Article II includes new types of leadership techniques that help employees to share ideas with each other, which will lead organizations away from the single-loop type of routinized behaviour and towards innovative behaviour (double- and triple-loop behaviour).

Fifth, ambidextrous organizational environments will become more popular. Scholars are well aware of the benefits of ambidextrous environments (Li et al., 2015), but now practitioners have also started to show their interest. Practitioners, however, call these environments digital business agile environments (EY, 2013; Wade, 2015; World Economic Forum, 2017). Regardless of the name, ambidextrous environments enable organizations to anticipate changes, question and alter their current work practices and services, effectively experiment with and deploy new technologies, and collaboratively learn from their failures and successes. These organizational skills are essential in order to be innovative, experimental and groundbreaking during the digital business transformation. Therefore, the management should not just focus on measuring the end results of various outdated work processes anymore, but rather should focus on creating new ambidextrous organizational environments, where the organization's cognitive skills (single-, double- and triple-loop skills) can be fully brought into use.

Establishing an ambidextrous organizational environment requires new types of management practices. Catmull and Wallace (2014), for example, claim that managers, who want to build up creative (explorative) organizations should not try to control creativity, but rather focus on removing organizational obstacles (norms and structures) that hinder it. The dualistic CIO toolbox created in Article II includes management practices (leadership principles, see Table 9) that allow managers to remove organizational obstacles. The CIO toolbox also includes traditional metric-based practices to motivate an organization to behave exploitatively. Hence, the CIO toolbox can be used to create an ambidextrous organizational environment, in which both exploitative and explorative behaviours are encouraged. Argyris and Schön (1974) described such an organizational environment, in which an organization is allowed to behave ambidextrously, and named it the Model II principled environment (see Section 2.1).

5.3. Theoretical and practical contribution

This dissertation contributes both theoretically and practically to *Information Systems (IS) research*; primarily in the areas of digital business transformation and digital business models, but also in the areas of performance management, business process outsourcing and IT management. Additionally, this dissertation contributes to *organizational research* in the areas of ambidexterity, hybridity, organizational learning and organizational design in relation to IT roles.

The first theoretical contribution of this thesis is the conceptual framework, ***the dualistic CIO toolbox***, which is developed in Article II and illustrated in Table 9. The dualistic CIO toolbox offers new ways of leading organizations towards ambidexterity, as it combines traditional metric-driven steering techniques with new types of leadership principles. The dualistic CIO toolbox is also a tool for practitioners. By using this tool, practitioners can increase the IT department's collaborative role in the digital business transformation. For practitioners, it is also important to understand why this new steering tool is required. This is explained in Article I, which concludes that only 3,6% of the current ITIL metrics measure (and therefore can be used to reward) explorative

innovative behaviour, whereas 96,4% measure effective and error-free behaviour. This explains why current metric-driven steering practices (such as ITIL), when used to motivate and reward IT organizations, have a negative impact on the digital business transformation.

The second theoretical contribution of this thesis is ***the chain-reaction model of digital business transformation***, which is illustrated in Figure 1 (see Section 1.3). It provides a simplified, logical chain model of how the digital business transformation triggers parallel business models. To manage these parallel business models, companies start to perform hybrid organizing activities, which, in turn, form ambidextrous organizational environments. At the practitioner level, these issues are explained in Article III. Article III offers value to practitioners by explaining how to build digital know-how (by implementing Robotic Process Automation within the organizational context). It also explains how to build and adopt a new digital business model by utilizing the attained digital know-how, existing outsourcing capabilities, and by re-organizing (hybrid organizing) existing organizational structures, roles and practices. The dissertation advises practitioners on how to successfully re-organize/adjust their organizational steering and working practices, organizational roles and behavioural environments. Practitioners also learn that the ultimate way to succeed in the digital business transformation is (via hybrid organizing) by creating an ambidextrous organizational environment, which Argyris and Schön (1974) define as the Model II regulated environment.

The third and final theoretical contribution of this thesis is ***the three-phase process model of digital business transformation***, as illustrated in Figure 5. The process model describes *a firm's typical journey through the digital business transformation*. The model pinpoints various organizational challenges and ways to solve these challenges (e.g. by using hybrid activities). For practitioners, the model can be used as high-level guidance to “travel” successfully through the digital business transformation.

5.4. Limitations and future research

This dissertation, as with all research, has its limitations. The first limitation relates to the use of conceptual research methodologies. The conceptual methodologies (of Nuopponen, 2010 and Walker and Avant, 2011) that were chosen to construct conceptual frameworks (in Articles I and II) included two separate phases. In the first phase, a set of learning concepts were derived from the organizational learning theory of Argyris and Schön (1974), and, in the second phase, the concepts were converted to the IT context. The conversion phase required the author to use her extensive practical experience of IT management. Hence, the way that the conceptual frameworks were constructed relied on the author's own interpretation skills, as well as her formal logic. However, as conceptual methods tend to rely on the researcher's ability to use her/his interpretive skills and his/her positivist understanding (e.g. use of formal logic), this dependency on the author's interpretation can only be seen as a general limitation of conceptual methodologies.

The second limitation of this dissertation relates to the use of qualitative methods (in Article III) to conduct a case study within the digital business transformation environment. While this methodological choice enabled an in-depth interpretive understanding of the phenomenon in

question, it has its disadvantages. The methodological choice can be considered to limit the generalizability of the case study findings to the domain context studied. However, according to Lee and Baskerville (2003), the results of the qualitative research can be used to make claims about analytical generalizability. These claims, combined with the earlier findings from other qualitative researchers on the subject matter, can then be used to form mid-range theories (Gregor, 2006). In fact, the use of mid-range theories can help to build stronger theoretical logic and advanced methodological rigor, and are currently the most used theoretical approach in the IS discipline (Grover and Lyytinen, 2015). In Article III, the claims were constructed as general recommendations (lessons learned), which were then used as building blocks, together with the findings from Articles I–II, to propose the following mid-range theories: (1) the chain-reaction model of digital business transformation (see Figure 1) to illustrate at a high level how the digital business transformation affects firms, and (2) the three-phase process model of digital business transformation (see Figure 5) to answer the dissertation-level research question.

Future research: As the digital business transformation proceeds, entirely new types of hybrid companies are likely to emerge. The concepts of hybridity and ambidexterity will be useful analytical tools to study these company transformations. The author believes that this dissertation inspires other scholars to further study hybridity and ambidexterity in the following areas.

Firstly, there is a need for practical-oriented research to study how different types of organizations create ambidextrous organizational environments through hybrid organizing. Hybrid organizing should not only be studied in the outsourcing supplier environment, as carried out in Article III, but should also extend to other case environments, such as customer environments. There is also a need to test whether the dualistic CIO toolbox (see Table 9) can be used as a steering tool to create such environments.

Secondly, there is a need for future research to improve the current definitions of organizational ambidexterity and hybridity. This is because the digital business transformation will bring many new combinations of business forms, perhaps also businesses, which will switch between various forms depending on the time period (e.g. the seasons of the year) or depending on environmental triggers (e.g. rapidly changing end-customer preferences). Along with new types of organizational forms, new types of organizational roles that possess different hybrid abilities will also emerge. Therefore, the differences and overlap between these two concepts should be better defined, to determine whether these concepts define temporary or permanent types of abilities, and whether there is a need to define entirely new concepts.

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Appendices (Questionnaires for Article III)

Appendix A-1: Questionnaire for employees/managers (FI)

A. Robotin kehitystyö, käyttöönotto ja jatkuva käyttö

- **Projektiorganisaatio kehitystyön ja käyttöönoton aikana (kaikki)**
 - Mikä oli SINUN rooli kehitystyön ja käyttöönoton (sekä koulutuksen) aikana
 - Mitä tavoitteita SINULLE oli asetettu projektin aikana?
- **Projektin historia (projektijohto)**
 - Kertoisitko hieman projektin historiasta (milloin kehitystyö alkoi, milloin Roger 1. kerran otettiin käyttöön)?
 - Keille kaikille Roger on implementoitu ja onko sitä käytetty myös OpusCapitan sisäisten rutiinien automatisointiin?
 - Miten näet Rogerin jatkokehityspolun (karkealla tasolla)?
- **Projektin eri osapuolten välinen yhteistyö projektin aikana ja sen jälkeen (kaikki)**
 - Miten yhteistyö mielestäsi kehittyi projektin aikana:
 - Palkka-asiantuntijoiden ja teknisen organisaation välillä?
 - OpusCapitan ja 3.osapuolien välillä?
 - Kuinka yhteistyö sujuu nyt käyttöönottoprojektin jälkeen?
- **Robotin toiminta (tekniset henkilöt)**
 - Mitkä ovat ohjelmistokomponentit jotka muodostavat palkanlasku-robotin (Roger:in) palveluketjun?
 - Miten robotin ja ihmisen välinen kommunikointi tapahtuu?
 - Miten Roger toimii virhetilanteissa?
 - Miten robottia autetaan virhetilanteissa?
 - Miten Service Desk:iä ja asiakasta informoidaan Rogerin ongelmista?
- **Projektin mahdollistajat (projektijohto)**
 - Mitkä tekniset innovaatiot tai ohjelmisto komponentit mahdollistivat Rogerin?
 - Mistä periaatteista/tottumuksista mielestäsi piti luopua jotta Rogerin kehittäminen ylipäätään voitiin aloittaa?
 - Mitkä muut asiat olivat olennaisia jotta Rogeria voitiin lähteä kehittämään?
- **Projektin haasteet (projektijohto)**
 - Mitkä olivat suurimmat haasteet/ennakkoluulot/ tabut/ esteet ja selviytymiskeinot?
 - Mitä haasteita 3.osapuolet asettivat robotin kehittämiseksi?
 - Mitä haasteita piti ratkaista johdon tuen avulla (escalointi)?
 - Oliko jossain vaiheessa vaikeuksia löytää oikeata tietoa, saada apuja muilta (tieto vanhentunut tai vaikeasti saatavilla?)
- **Projektin tavoitteet (kaikki)**
 - Mitkä olivat projektin alkuperäiset tavoitteet?
 - Muutettiin tavoitteita mahdollisesti projektin aikana (ja miksi)?
 - Mitä yllätyksiä ilmeni projektin aikana?
 - Kuinka tavoitteista informoitiin muuta organisaatiota, asiakasta, projektin omistajaa?
 - Tehtiinkö projektin aikana Rogerista demoversioita (projektin edistymisen havainnollistamiseksi)?
 - Tavoitteiden jälkikäteisarviointi:
 - Missä onnistuttiin hyvin (ja miksi)?
 - Missä keskinkertaisesti (ja miksi)?
 - Mihin pitäisi jatkohankkeissa erityisesti kiinnittää huomiota (ja miksi)?
- **Projektista opitut ”lessons-learned” –läksyt (kaikki)**
 - Mitä tärkeimpiä asioita ottaisit esiin joista muut jatkossa voisivat oppia?
 - Onko ”lessons-learned” asiat rekisteröity mihinkään?

- **Robotin käyttö (kaikki)**
 - Mitä ongelmia robotin käytön aikana on ilmennyt ja miten niistä on selvitty?
 - Mikä on toiminut hyvin?
- **Rogerin innovaatioprosessi jatkon osalta (kaikki)**
 - Käsitelläänkö Rogeriin liittyviä ideoita säännöllisesti jossakin ryhmässä?
 - Mihin ideat rekisteröidään?
 - Miten uusia ideoita testataan?
 - Miten uusien ideoiden luomista motivoidaan yrityksessä?
 - Keiden luulet jatkossa osallistuvan Robotin kehittämiseen?

B. Muutosjohtaminen ja koulutus

- **Johdon, lähimmän esimiehen tuki ja vaikuttaminen (tekniset + palkka-asiantuntijat)**
 - Miten SINUA informoitiin Robotin kehittämisprojektin alkamisesta? Entä etenemisestä?
 - Miten lähin esimiehesi osoitti SINULLE tukensa Robotin kehittämisprojektin aikana? Entä nyt?
 - Mitä tukea johto antoi Robotin kehittämisprojektin aikana? Entä nyt?
 - Tunsitko että sinulla oli vaikuttamismahdollisuuksia projektin tavoitteisiin liittyen?
- **Tiedottaminen (projektijohto)**
 - Miten informoit projektin alkamisesta ja etenemisestä?
 - Keskustelitko eri osapuolten kanssa aktiivisesti projektin tavoitteista?
- **Tunteet, pelot, väärinymmärrykset, ennakkoluulot ja niiden kohtaaminen ja käsittely/ylitsepääseminen (kaikki)**
 - Millaisia ennakkoluuloja/pelkoja sinulla (tai muulla organisaatiolla) oli alun perin Rogerin kehittämisprojektista?
 - Miten niitä on organisaatiossa käsitelty?
 - Onko niistä päästy yli (ja jos on niin mikä edesauttoi)?
 - Mitä asioita pitäisi edelleen käsitellä (ja miten)?
- **Eri tavoitteiden kohtaaminen ja kompromissit (kaikki)**
 - Miten organisaatiossa käsiteltiin tilanteet joissa projektin eri osapuolet kokivat ristiriitaisia tavoitteita?
 - Pitikö projektin aikaisia haasteita eskaloida johdon tasolle, jotta yhteisymmärrys/kompromissi lopulta löytyi?
 - Mitä tällaiset asiat siinä tapauksessa olivat?
- **Henkilöstötyytyväisyys (projektijohto + palkka-asiantuntijat)**
 - Onko Rogerin käyttöönoton jälkeen tehty henkilöstön tyytyväisyyskyselyjä palkanlaskijoille?
 - Jos, on millaisin tuloksin?
 - Entä asiakkaalle?
 - Jos, on niin millaisin tuloksin?

C. Palkanlaskennan toimintaympäristö ennen ja nyt (palkka-asiantuntijat)

- **Palkka-asiantuntija -organisaatio**
 - Ennen?
 - Nyt?
 - Sinun roolisi?
- **Työympäristön muuttunut kulttuuri**
 - Kiinnitätkö työssäsi huomiota eri asioihin kuin ennen?
 - Tunnetko että sinulla on mahdollisuus vaikuttaa asioihin paremmin kuin ennen?
 - Jos saat idean, onko sinulla kanava jonka kautta voit vaikuttaa?
 - Käyttekö aktiivisesti työympäristössäsi läpi ehdotettuja ideoita ja parannettavia asioita?
 - Miten palkanlaskenta voisi mielestäsi "kehittyä" tulevaisuudessa?
- **Työrutiinien muutos**
 - Mitä uusia työrutiineja on tullut Rogerin myötä?
 - Mitä poistunut?
 - Mitä muokattu?
 - Miten ns. ylimenokaudella toimittiin?

- **Raportointi**
 - Onko raportointi muuttunut Rogerin myötä?
 - Mittaatteko Rogerin työn laatua jollakin tavoin?
 - Oletteko tutkineet miten laadun taso on muuttunut Rogerin käyttöönoton jälkeen?
 - Pitäisikö laatua pystyä mittaamaan jollakin muullakin tavoin kuin nyt?
- **Ajankäyttö per tehtävä**
 - Miten työpäiväsi jakaantuu eri tehtäviin?
 - Koetko että sinulla on enemmän aikaa asiakaspalveluun tai muuhun Rogerin myötä?
- **Uusien toimintatapojen dokumentointi**
 - Mihin järjestelmään dokumentoitte?
 - Dokumentoitteko asiakas-kohtaisesti?
 - Onko eri asiakkaiden välillä suuria eroja rutiineissa?
 - Millä periaatteilla dokumentoitte?
 - Avainsanojenko: Rutiinin nimi, asiakkaan nimi, ohjelmistot ja funktiot joita rutiini käyttää?
 - Linkitättekö rutiinit kokonaisprosessin (joka siis sisältää myös manuaalirutiineja)?
 - Miten rutiinien päivitys tapahtuu esim. uusien ohjelmistoversioiden myötä?

D. Palkka-asiantuntijan koulutus ja identiteetti (palkka-asiantuntijat)

- **Koulutus**
 - Keitä kaikkia Rogerin osalta koulutettiin?
 - Miten sinua koulutettiin?
 - Vastasiko koulutus tarpeitasi?
 - Saitko mahdollisuuden vaikuttaa koulutuksen sisältöön tai tavoitteisiin?
 - Onko Rogerin käyttöönoton tai käytön aikana pitänyt keksiä uusia toimintatapoja, joita koulutuksessa ei opetettu?
 - Saitko mahdollisuuden keskustella muiden kanssa oppimistasi taidoista?
 - Miten koet että koulutuksessa oppimasi tieto on "jalostunut" käytön myötä?
 - Tunnetko että voisit käyttää kaikkea oppimaasi muuhunkin kuin mihin nyt käytät sitä?
 - Miten mielestäsi koulutusta voisi kehittää?
- **Roolin muutos ja uudet taidot**
 - Mitä taitoja et mielestäsi enää tarvitse siinä määrin kuin ennen?
 - Mitä uusia taitoja olet joutunut oppimaan?
 - Mitä muita taitoja vielä haluaisit oppia?
 - Mikä on mielestäsi suurin muutos roolissasi Rogerin tulon myötä?
 - Mikä on ollut uusissa työtehtävissäsi haastavinta?
 - Mikä mielenkiintoisinta?
 - Miten näet palkanlaskijan ammattiin opiskelun muuttuvan robotiikan myötä?
 - Miten koulutuksen pitäisi jatkossa muuttua?
- **Robotin ja palkanlaskijan välinen yhteistyö**
 - Miten kommunikoit Rogerin kanssa?
 - Epäiletkö joskus Rogerin raportteja? Mitä tuolloin teet?
 - Onko luottamuksesi kasvanut Rogeria kohtaan ajan myötä?
 - Mitä haluaisit muuttaa Rogerissa?
 - Mikä toimii hyvin?
 - Mitä mieltä olet siitä että palkanlaskurobotille on annettu nimi: Roger?
 - Jos sinun pitäisi kuvailla Rogeria "ihmisenä", niin miten kuvailisit Rogeria?
- **Palkka-asiantuntijan mittarit ennen ja nyt**
 - Annettaanko sinulle nykyisin ajallisesti mahdollisuus keksiä/parantaa toimintatapoja?
 - Oletko mielestäsi saannut vaikuttaa uuteen roolisi riittävästi?
 - Mitataanko sinua nykyisin eri kriteerein kuin aiemmin?
 - Miten haluaisit että sinua mitattaisiin?
 - Missä haluaisit kehittyä?

Appendix A-2: Questionnaire for employees/managers (ENG)

A. Development, deployment and use of the robots

• **Project organization during the RPA project (all)**

- What was your role during the development phase, the deployment phase and the training phase?
- What were your goals during the RPA project?

• **Project history (project management)**

- Could you tell about the project's history (when did the RPA development start, when Roger - the payroll software robot - was for the first time taken into use?)
- Who are using Roger and is Roger automating also internal processes in OpusCapita?
- What do you think will be the future for Roger?

• **Co-operation between different parties of the project organization– during and after the implementation project (all)**

- How did the co-operation develop during the project:
 - Between the payroll experts and the technical organization?
 - Between OpusCapita and the 3rd party RPA supplier?
- How does the co-operation function now (after the project is completed)?

• **The robot in operation (technical persons)**

- What are the software components that make up the service chain of Roger (the payroll robot)?
- How do the robot and the human communicate?
- How does Roger function in error situations?
- How is the robot supported in error situations?
- How are Service Desk and the client informed about Roger's problems?

• **The project enablers (project management)**

- What technological innovations or software components made possible to create Roger?
- What principles/habits needed to be changed in order to develop Roger?
- What other things were needed in order to develop Roger?

• **The challenges of the project (project management)**

- What were the biggest challenges/prejudices/tabooes/barriers and how did you manage them?
- What were the challenges related to the 3rd Party RPA supplier during the project development?
- What were the challenges that were escalated to the management level (of OpusCapita)?
- Was it sometimes difficult to find the right information or to get help from others?

• **The project targets/objectives (all)**

- What were the initial objectives of the project?
- Did the project goals change during the project implementation (and why)?
- Did any unusual things (surprises) happen during the project implementation?
- How were the project objectives informed to the organization, clients and the project owner?
- How was the progress of the project informed/illustrated? (Were robot demonstrations used?)
- Post-evaluation of the project targets:
 - In what way was the project successful (and why)?
 - In what way was the project average (and why)?
 - What issues should the future projects particularly pay attention to (and why)?

• **Lessons-learned of the project (all)**

- What are the most important lessons-learned that others in OpusCapita could learn of?
- Are lessons-learned experiences registered / stored somewhere?

• **Using Roger, the robot (all)**

- Did Roger cause any kind of problems (while it worked) and how were these problems solved?
- What has worked well with Roger?

• **Further development of Roger (all)**

- Exists there any groups or teams that regularly review development ideas related to Roger?
- Are these ideas registered somewhere?

- How do you test/experiment these new ideas?
- How does your company motivate for creativeness?
- Who do you think will participate in the further development of the software robots?

B. Change management and training

- **Support given by the management and the nearest supervisor (technical persons and payroll employees)**
 - How did you hear about the decision to start the robotic development project? And later about the project progress?
 - How did your nearest supervisor show you his/her support during the robot development project? And now?
 - How did the management show you their support during the robot development project? And now?
 - Did you feel that you could influence the project objectives?
- **Communication (project management)**
 - How did you inform the organization of the project start and progress?
 - Did you discuss with any parties of the project objectives?
- **Emotions, fears, misunderstandings, prejudices and encountering them (all)**
 - What were your original prejudices / fears related to the robotic development project?
 - How were the prejudices / fears treated in the organization?
 - Did the organization manage to overcome their prejudices/fears (and if so, what helped)?
 - What issues should still be discussed / solved (and how)?
- **Encountering contradictory targets and compromises (all)**
 - Did the different project parties discuss of conflicting objectives?
 - Did the project escalate any issues to the company's management level - to create compromises?
 - If yes, what were these issues?
- **Employee satisfaction (project management & payroll employees)**
 - Have payroll employees responded to any satisfaction surveys after Roger was taken into use?
 - If yes, what have been the results?
 - Have any clients responded to satisfaction surveys?
 - If yes, what have been the results?

C. Payroll environment - before Roger and now (payroll employees)

- **Payroll employee organization**
 - How did your organization look like before Roger came?
 - How does it look like now?
 - What is your role in the organization?
- **The new working culture**
 - Do you draw attention at work on different things than before?
 - Do you feel that you have a better chance than before to make a difference?
 - If you get an idea, do you have a channel that you can use to influence?
 - Do you and your colleagues actively review new proposed ideas and improvements?
 - How do you think the payroll could evolve in the future?
- **Changing work routines**
 - Has your unit taken into use any new work routines after Roger was taken into use?
 - Have any routines been modified?
 - How did your unit manage the transition period from old routines to new ones?
- **Reporting**
 - Have the reporting routines changed after Roger was taken into use?
 - Does your unit measure quality of Roger's work?
 - Has your unit investigated, whether quality has improved after Roger was taken into use?
 - In case the quality is measured: Should one measure the quality in any other way than is done now?
- **Time usage per task**
 - How does your work day look like? (What are your working tasks?)

- Do you feel that you have more time to serve your customers now than earlier (=before Roger was taken into use)?

- **Documenting new work practices**

- What system(s) do you use to document your new work practices?
- Do you document practices separately to each client?
- Do different customers have different practices?
- What principles/logics do you use to document?
 - For example: the routine name, customer name, and software functions that the routine uses?
 - Do you link the routines to the high-level process (that also includes manual routines)?
- How do you update Roger's routines after you have taken into use a new version of an application that Roger uses?

D. Training and the identity of the payroll employees (payroll employees)

- **Training**

- Who have been trained to work with Roger?
- Have you been trained (if yes, how)?
- Did the training fit your needs?
- Have you been able to influence the content or goals of the training?
- Did your unit invent new work practices that were not taught during the introduction or use of Roger?
- Did you have the opportunity to discuss with others what you had learned?
- Do you feel that your knowledge of Roger has evolved (grown) after you started to work with Roger?
- Do you think you could use the knowledge of robotics to other things than what you are now using it for?
- How do you feel that training could be developed?

- **The changing work role and new skills**

- What skills do you think you no longer need as much as before?
- What new skills have you learned?
- What other skills do you still want to learn?
- What do you think is the biggest change in your work role after Roger arrived?
- What is the most challenging of your new work practices?
- What is the most interesting of your new work practices?
- How do you see the robotics will change the education of the payroll profession?
- How should the education change in the future?

- **Co-operation between the robot and the payroll employee**

- How do you communicate with Roger?
- Do you ever suspect Roger's reports? What do you do then?
- Do you trust Roger more now than in the beginning?
- What would you like to change in Roger?
- What does work well?
- What do you think about that the payroll robot is called Roger?
- If you should describe Roger as a human, how would you describe Roger?

- **The criteria of measuring a payroll employee (before and after Roger)**

- Do you feel that you have a possibility to improve your work?
- Do you feel that you have enough influence on creating your new work role?
- Are you currently being assessed on different criteria than before?
- What criteria would you like to use to measure your own work?
- Which new skills would you like to learn?

Appendix B: Questionnaire for RPA team leader (ENG)

A) RPA program (Robotic Process Automation):

- 1) What did the production people (payroll employees) think about robotics (a) during the RPA implementation and (b) after RPA had been taken into everyday use?
- 2) What were the biggest challenges of the RPA deployment and how did you (your team) solve these problems?
- 3) What do you think are the most critical elements, which are needed, to successfully expand the RPA usage in your company?

B) The co-operation between the RPA unit and the CIO/the IT department:

- 1) Did the CIO participate in the RPA program?
- 2) If yes, were there any important issues to be solved, and if yes, how did you solve these issues?

C) The common language between the RPA consultants and the production/business people

(common language = payroll slang + programming slang):

- 1) How critical was the common language for the success of the RPA program and what were the steps / actions to create the common language?

D) RPA vs. people effectiveness:

- 1) Do you have any thumb-rules to “measure” effectiveness of the robots (compared to effectiveness of people). If yes, in what circumstances does this rule apply?

Appendix C: Questionnaire for the leadership (FI/ENG)

Teemat/Themes:

#1:

(FI) Mitä ovat RPA käyttöönotolta odotetut ja toteutuneet hyödyt?

(ENG) What were your initial expectations of RPA benefits to OpusCapita? Were these expectations met?

#2:

(FI) Miten tehtiin päätös RPA:n käyttöönotosta, minkälaisia asioita pohdittiin ja mitä haasteita käyttöönotossa koettiin?

(ENG) Who decided to introduce Robotic Process Automation (RPA) in OpusCapita? What issues were considered? In what way was the robotic deployment challenging?

#3:

(FI) Mitkä ovat näkemyksesi tulevaisuudesta, mihin kehitys suuntautuu, minkälaisia palveluja/prosesseja tulevaisuudessa voitaisiin automatisoida?

(ENG) Can you tell about your future visions? What kinds of services / processes could be automated in the future?

#4:

(FI) Miten näet ulkoistus toimialan kehityksen ja miten automatisointi tulee vaikuttamaan siihen?

(ENG) How will the outsourcing industry develop and how will the software automation affect it?

Digital business transformation (or digital transformation for short) is defined as the use of digital technologies to radically improve a company's performance (Fitzgerald et al., 2013). However, at present, many traditional companies struggle to gain transformational effects from new digital technologies. To truly drive value through digital business transformation is to implement a new, successful digital business model. To succeed with this, traditional companies must learn to keep their existing business model productive (exploitative behaviour) and simultaneously introduce innovative services, products and practices into the new digital business model (explorative behaviour). Managing both business models simultaneously requires that companies learn to re-organize (that is, hybrid organize) their current organizational roles and practices. Hence, this dissertation helps to understand how digital business transformation affects firms' business models, including organizational structures and practices, as well as how hybrid organizing can enable firms to achieve a successful digital business transformation.



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