

Digitalization of the finance function and hybridisation in departmental battles: a multiple exploratory case study

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Abstract

In this paper, we investigate technology advancements and their impact on the finance function, more specifically, we are focusing on the digitalization of the finance function. Previous literature on accounting information systems and later enterprise resource planning systems find that opportunities as well as challenges arise when companies are adopting new systems and processes. By conducting an exploratory multiple case study, we find that the case companies are in a varying degree adjusting to the changing context in which they operate. Adoption of digital solutions is mostly seen in the customer facing activities while back-end processes are given less priority. The reasons for the low prioritization are: return on investment, time consumption, complexity of the relationship with legacy systems, and cultural obstacles. The technological advances are making it possible to replace manual labour and this is causing a shift in control of the technology. The IT department is gaining more control but it is mitigated through hybridisation of the finance function. We argue that the finance function is not being replaced but rather there is a change of roles and responsibilities and therefore it is the old corporate structures and systems that are going to disappear.

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1. Introduction

“The finance function will disappear”. This particular claim was stated by a CIO in a telecommunications company, but as we will understand, changes to the finance function are not as straightforward as one might think. The finance function has been evolving for a very long time but it has yet to break free from manual work and inefficient processes. The evolution has been taking place during three phases and we are currently in the third phase which is related to digitalization. This is changing the way consumers interact with companies, it also enables the companies to track and target the customers in a more accurate way and automate manual and repetitive processes through the use of robotics and artificial intelligence. However, in this multiple case study which is based on four companies operating in four different industries, we see little changes in how the back-end processes are carried out. Instead, in a varying degree, we are seeing that the companies are adjusting themselves and their finance functions in order to be in a better position for when they decide to fully embrace digitalization.

The extant literature on the role of the finance function and the accountants' work show that it has been evolving in line with technology and consequently became more dependent on it. The finance function's role started off by being concerned about bookkeeping, variance control, and producing reports for management (Simons, 1954). As time went on, technological advancements created new tools for the finance function to work with, such as computerized information systems (see e.g. Lyytinen, 1987). These new systems amplified the accountants' work in the way that they could record more detailed transactions and produce more accurate analyses. But the implementation process was not always successful, and issues connected with data flaws and usage complexity was hindering the adoption. The image of the accountant has been associated with someone who is adding little value; the word used to describe an accountant has been “bean counter” (Friedman and Lyne, 1997). But we also see that the accountants have started to be more involved with other business areas i.e. becoming a business advisor (Mouritsen, 1996; Granlund, 2002; Humphrey and Scapens, 1996; Allot et. al., 2001). The adoption of the business advisor role has been said to depend on various parameters. Granlund and Lukka (1997) analyse the accountants in a Finnish context and find that cultural and personality aspects play a role in determining how suitable it would be for the accountant to become a business advisor. The finance function also struggles with its two-sided purpose, there is a tension between centralization and decentralization (Busco et. al., 2008). On the one hand they act as a centralized anchor for the organization where the different business activities are summed up and translated into financial numbers and reported to

different stakeholders. On the other hand, it is becoming more important to be decentralized in the sense that the accountants are expected to be closer to the business managers' work so that the integration with finance can be improved. ERP systems were the next step in the evolution of the finance function and the accountants' work. The era of Internet and globalization started to put more pressure on the ability to gather more information from an increasing number of locations, and the ERP system was intended to solve this issue. One system could now provide information to anyone who had been granted access, and this could be done from anywhere (Davenport, 1998). By adopting new systems that are more complex and feature rich compared to the previous information systems coupled with access to the internet made it easier to integrate and communicate financial information to the rest of the organization. After implementing an ERP system, the level of control was in most cases increased but Quattrone and Hopper (2005) show that the opposite, loss of control, could be experienced. The number of accountants has long been assumed to decrease. While some claim that the ERP systems are responsible for that trend (Anastas, 1997) other argue that this has been the case even before the implementation of ERP systems (Newman and Westrup, 2005).

In some way, the tension of decentralization and centralization was managed by ERP systems as they made financial information easily accessible, but on the other hand, the accounting practice such as recording transactions and other various accounting tasks still required manual repetitive work. The benefits of using an ERP system were therefore enjoyed more by the user of the information rather than the producer i.e. the actual accountants. The accountants still had to manually record daily transactions and perform reconciliation of accounts to make sure no mistakes had been made throughout the month or during a specific period. However, in the next phase, more current research has explored digital solutions and how business models and valuations are different from the past. New services and products are priced and developed differently, valuations diverge more from the fundamental numbers - indicating that an increasing part of the company's value is attributable to other information not captured by traditional accounting (Grover and Ramanlal, 2004; Lev and Zarowin, 1996; Srivastava, 2014). The information that could help close the gap and explaining the some of the void between the fundamental numbers and the market valuations could be traced to big data. Big data spans further than the reach of today's accountant and analysis based on big data can prove to be very important going forward (Arnaboldi et. al. 2017). The question is whether the accountants can adopt this data and analysis since they are used to work in a different way, how will they handle the big data that is becoming increasingly important? Digitalization within business context is a concept of operations and processes

becoming more automatic and digital. Everything becomes more accessible and transparent and a better collection of data allows for real-time handling, measurements and adjustments (Vasarhelyi, Kogan and Tuttle, 2015). However, digitalization also makes some players redundant and possibly changes the technology power loop (Newman and Westrup, 2005; Scarbrough and Corbet, 1992). Thus, a clash of functions and tensions between departments can be observed. The course is set and clear, the advancements in IT map a new landscape in which business is carried out. This poses once again new challenges that the finance function has to adapt to. The impacts will be bigger this time since the need for having accountants who are manually recording every transaction will be smaller than before. We find that the literature on digitalization does not cover the digitalization within the context of accounting and finance in large companies. The articles are mostly concerned about the conceptual meaning and implications stemming from digitalization and there is a clear gap in identifying the changes and actions companies have taken to handle this new phase. This paper aims to bring more insight into the topic, explore how companies in various industries tackle this challenge and whether the accounting and CFO function has changed in any way in order to become more valuable for the companies. As the possibilities for IT implementations within the companies become close to limitless, the question of what happens to the finance function appears to be inevitable. Will the finance function adapt and possibly change its function and role in the companies? Or will it fade away only to get replaced by the AI and robotics? Our research question is:

What is the position and role of the finance function in a digitalized environment where manual work is no longer needed?

To investigate this, we conduct an exploratory multiple case study by conducting interviews at four different companies – TellCo in the telecommunications industry, AirCo in the airline industry, HotelCo in the hotel industry, and BookCo in the book publishing industry. These companies vary in several dimensions, such as: different products, customers, necessity of digitalization, legacy and history. This helps with providing a setting which is broad enough to study the tensions and provide insight and an underlying foundation not too focused and specific only to one industry, which will be beneficial for further research and analyses.

The thesis will be structured in the following way. Articles about the changing role of accountants and the finance function and its increasing dependence on IT will be introduced in the theory part.

This will be followed by the information about the research design, data gathering and data analysis. In the last part, the empirics and analysis will be presented.

Definitions of the key concepts

Throughout the thesis, we use several key concepts that need to be defined. First and foremost, it is the finance function itself. In the classic sense, the finance function handles the funds of the company needed for the business operations. It controls and reports the usage of these funds through various accounting techniques in order to meet regulatory requirements and reporting standards, e.g. IFRS. In our thesis, however, we look at the finance function from a broader standpoint. We keep the accounting and the reporting functions but on top of that, we are adding the procurement of funds and their effective utilisation in business, where the finance managers take different decisions related to the funds, e.g. in which way they can be obtained or what is the best way of financing an investment. Therefore, we are mainly concerned about the analytical part of this function.

The second key concept is the digitalization. Digitalization within business context is a concept of operations becoming more automatic and digital. All the data and financial numbers become more accessible and transparent and their better collection allows for real-time handling, measurements and adjustments. While this helps management accountants with preparation of financial statements and catering for events that have already happened, making easier analyses, it also helps with strategic planning for much shorter periods. This explanation pinpoints that we are not interested in the actual process of making things digital, i.e. the digitization, but rather how the operations and the finance function changes with the digitalization. In this thesis, we have determined three levels of digitalization – automatization, robotics, and AI.

Last but not least, we mention the front-office and the back-office, or the front-end and the back-end. The front-end largely consists of client-facing roles and it mostly generates revenues for the company. We do not talk only about the sales and marketing departments, but also about the products since the digitalization of the front-end mostly affect them or the services related to them. The back-end, in general, are all the administrative and support departments. This includes both the IT department as well as the finance function. It also includes other departments such as HR, or compliance, however in this thesis the biggest attention is given to the finance function and thus

when talking about the digitalization of the back-end, we are mostly concerned about how much the finance function and the processes revolving around it are digitalized.

Recently, there has been a surge in the use of the definition of the middle-office, which is mainly revolved around various strategic managerial functions. It provides the link between the front-end and the back-end, making use of the various back-end analyses and affecting the revenue generation. The most notable examples of the middle-office would include strategic, risk and credit management. However, since we look at the finance function from a broader perspective, we disregard this definition and merge these departments into the back-end.

2. Theory

In this section, we will review the current outstanding literature related to the finance function and the role of the accountant. We begin by illustrating what impact new technologies have had on the profession and what value the function has brought to the rest of the organization in a historical perspective. We also look at how new developments have paved the way for a digitalization of the society, and in this study, we will bring necessary empirical evidence of the digitalization trend in four different companies to show what the current state is and what this has meant for the accountants. We therefore position our study in the domain of accounting systems and the role of the accountant.

2.1 Finance function and accountants in three phases

Volume, velocity, and variety are characteristics of accounting information, however, as we will come to an agreement of, the evolution and advancement in technologies which have been taken place during the last decades have continuously amplified and expanded their meanings and implications for the finance function. In the following sections, we review the outstanding literature focused on accounting in relation to changes in the technology used by the accountants in the finance function. We start by addressing the periods where companies managed their accounting in silos, we then discuss the advent of ERP systems and its implications and we also discuss the current state of the finance function in a digital world. Lastly, we conclude by highlighting the gap in current literature and argue why it is important to address it.

2.1.1 Accounting in functional systems

In the early days of modern accounting, according to Simon (1954), the finance function carried three main responsibilities: record keeping, variance control, and temporary reports for decisions. This was before computers, back then, accounting did not provide detail of every transaction occurring in the business, it was managed in aggregation and detailed analysis was not possible to conduct. The manual work and lack of detailed analysis proved it hard for the accountants to provide any tangible value for the managers other than the collection and reporting of information. But with time, the advancement in technology resulted in computerised accounting systems where information systems ran on these computers aimed to support the finance function. Now, more details on transactions could be recorded and be more easily analysed. However, the systems were

not always implemented without issues, in the beginning there were problems with data flaws and usage complexity which made the systems hard to justify when taking the cost and time required into account (see e.g. Lyytinen, 1987). So, even though there are clear advantages with new technology, resistance could still exist which ultimately slows down the adoption pace.

As mentioned above, the early days of the modern finance function was more concerned with cost control and record keeping which from the management perspective did not add much value to the strategic discussions of the companies and this had its consequences. New literature based on the image of the accountant started to grow to show what place the finance function had in the organization, attention has been on the accountant rather than the systems used. The thought of accountants as mere bean counters plagued the profession for many years. Operational managers in several companies stated that the accountants' work provided them with information containing little relevance for running the business efficiently, and there were even those who thought that accountants could harm the business - but with the introduction of a new accounting technique: activity based costing, some managers started to change their opinion (Friedman and Lyne, 1997). In the interaction with other business areas and managers, the role of the accountant stretched further than being a provider of information for budget related work, the traditional definition no longer captured the variation of the accountants' work (Mouritsen, 1996). The interaction with other members of the organization implied that personal characteristics such as communication skills and other traits suitable for cooperation would be needed. Granlund and Lukka (1997) bring cultural and personality aspects to the equation and analyse the accountants' role in a Finnish context and find that personal attributes tend to affect how suitable the accountant is to become a business advisor/controller. The characteristics of a business advisor versus a bean counter include: excellent communication skills, emphasis on the present and the future - not on the past, team work instead of working on their own and that they act as a member of the management team rather than as an information collector. However, they still share the same traits when it comes to the fundamentals of accounting e.g. reliability, honesty, prudence, accurateness in terms of time. Furthermore, the authors talk about how the accountants started to become torn between two purposes. On the one hand, they act centralised in the sense that they are the function that will consolidate all the transactions occurring during the course of business. When the core elements of the accounting revolve around reporting and budget it is often sufficient to have the finance function in a central position. On the other hand, as we have noted above, the demands on the finance function are changing. More decentralization is required when the responsibilities of the accountants stretch further and when the expectation is that they ought to have more operational

knowledge. This struggle of being both centralised and decentralised is discussed by Busco et. al. (2008) and the authors provide insights on how to tackle this problem; instead of trying to solve the oppositional forces one must find ways of managing them in a constructive way. Performance measurement systems was in this case managing the tensions that arose when integrating a global organization. In our study, we will make use of these findings to better understand the challenges that occur in today's setting of digitalization processes.

To summarize, the volume of the accounting information prior to computerised systems was handled in aggregation and often in a central location, the velocity was low, and the variety of the information did not extend much beyond the fundamental numbers. As the computerised systems were put in use, more detail of the transactions was recorded, the information could be transferred more quickly, and seeing that interactions with other areas of the organizations increased, the variety in the information handled by the accountants increased as well. Also, the role of the accountant started to become more diverse as there is a realization that they can provide more value than mere reporting and information collection. As the role becomes wider, challenges start to develop, including the need to carefully manage the tensions of centralization and decentralization.

2.1.2 Accounting in enterprise resource planning systems

The accounting control systems was later complemented by Enterprise Resource Planning systems. A primary motivation for implementing a system of this nature was to solve issues connected with the expansion of businesses into new geographical areas but also in terms of scope, meaning that the diversity of the business increased as new products are introduced and more services are offered. Globalization and the internet were some of the forces driving that change. In the expansion of the business, the collection of information increased rapidly and became spread out and could no longer be stored in a single system. This caused information to become fragmented and expensive to manage (Davenport, 1998). One of the benefits in implementing and using a shared ERP system was that accountants no longer had to deal with multiple data entries in the consolidation process (Granlund and Malmi, 2002). Today, competition is stronger than ever before and to uphold the competitive edge in times like these is crucial for survival and profitability. Davenport (1998) discusses this matter in the context of ERP systems and questions whether it is appropriate to adopt such a system. Basically, the management team should determine their specific need and figure out whether there is a good fit between the organization and the ERP system.

Depending on what had underpinned the company's previous success, some companies lost its competitive edge, because, potentially every company could see drastic improvements and efficiency gains in their accounting systems. The ERP systems thus acted as a force capable of levelling the playing field in the market.

In the previous section, we highlighted a stream of research which started to investigate the role of the accountant, and to further develop that we examine what is changing when introducing ERP systems. Similar to the findings of the quantitative study by Mouritsen (1996), Allot et. al. (2001) argue that the role of the management accountant broadened to include work found in other areas - the accountants' work expanded to include a variety of business subjects. Where they differ, which to some degree could be explained by the nature of the studies, is in the way they expand on the meaning of the changes. Allot et. al. (2001) go deeper into what the accounting profession is transforming into and why, while the study of Mouritsen (1996) is giving the reader a good perspective of what five aspects the accountants' work entail, the depth is not there. Moreover, the ERP systems also made it easier for managers to spend more time on financial management, analysis, and forecasts rather than in the details of everyday bookkeeping (Newman and Westrup, 2005; Scapens and Jazayeri, 2003). Scapens and Jazayeri (2003) and Scapens (1996) move on by introducing the term decentring of the management accountants' knowledge to show that the ERP system functioned as a mediator of information, making it more widespread in the business. In the case study, the business line managers could thereby take on more financial responsibility of their own activities. Even though the managers did not explicitly say that they conducted management accounting, the tasks involved, among other things, preparation of budgets and cost control.

While we see that the accountants are taking on more responsibility that stretches further than before, at the same time we also note that the number of accountants seem to decrease. Namely, before the dawn of the ERP era, Anastas (1997) predicted that the introduction of an ERP system would prove accountants redundant and cause the number of accountants to decrease, however, the author claimed that the role of the remaining accountants would be detached from the strict area they used to roam in and would instead be liberated to help and provide value for other managers. The study by Newman & Westrup (2005) agrees to a certain degree but instead of holding the ERP systems fully responsible for the decrease they claim that the ERP system itself is not the only reason for the decrease of accountants - the trend had already started. Following the research on the accountants' work (Newman and Westrup, 2005; Mouritsen, 1996; Allot et. al., 2001), Sayed (2006) acknowledges that the work of the accountants is indeed changing but extends

the literature by exploring its expertise. The author talks about how the accountants are redefining their expertise through the way they are working and interacting with the ERP system. The relationship between the accountants and the system is becoming more complex. In one way, the accountant starts off by following the system's structure but they also start to reshape it as they are using it. The erosion of the accountants' value, which other researchers are referring to is not present in his findings, rather, the system and the actor should be regarded "*as being mutually redefined in relation to each other*" (p. 95).

Shifting focus to the implementation of the systems and how the rest of the organization reacts, Quattrone and Hopper (2005) show in two case studies, that the implementation of ERP systems in two organizations which are following different strategies had different outcomes. In one case, less control was obtained when more information was readily available for anyone to interact with. "*A more chaotic form of control substituted the linear one. It was difficult to know who was controlling whom, and when.*"(p.757). Information previously held by the accountant could now be manipulated from various locations within the organization. The implementation of the ERP system facilitated the accountants' work to be distributed to the rest of the organization and equipped everyone with more information and the ability to benchmark themselves to others. Rather than increasing the overall level of control, "*it marked a proliferation of constantly changing centres, varied and vacillating reasons for wanting accounting information, and managers with minimalist control.*"(p. 761). In the other case, the existing structures were reinforced - the ERP made sure that the managers stayed in the centre and maintained a clear sight over the other areas of the organization. Regarding the impacts ERP systems have had on accounting practice, Granlund and Malmi (2002) claim that little change has occurred despite its supposed advantages over the legacy systems. Functional and economic aspects such as high level of complexity and scarcity of resources seem to be the reasons for why this is the case, while organizational culture and general defiance of change only seemed to have played a small part.

What we see as the consensus in this era, is that the accountants and the accounting profession started to become less tied to its specific function - the ERP systems enabled the information to be seen and manipulated by various members in the organization which caused the accountants to wrest for control. In terms of the accounting data, the ERP system can handle larger volumes of information, it increases the velocity by making sure that information is available for everyone, and the variety has seen further increases with the involvement of different organizational groups.

2.1.3 Accounting for big data in a digitally based system

Similar to how the previous phases caused changes to the finance function and its members, the digitalization trend pose new challenges that the finance function must deal with. The core of this trend lies in the technological advancements and how e-commerce has challenged the traditional economic theories of cost structures, more specifically how firms balance fixed and variable costs. Fixed costs are now more difficult to recover due to the nature of research and development. Prices of a digital product now reflects the value which the consumer derives from using it, not the marginal cost of producing it (Grover and Ramanlal, 2004). Related to this, Lev and Zarowin (1996) found that accounting information such as earnings, cash flows and book values, have become less useful to investors. Srivastava (2014) argues that because of changes in business activities, such as more investments in innovation, IT, advertising and other intangible capital, valuations of companies are deviating more from their fundamental values. The intangible nature of the new investments prevents recognition in the financial statements and therefore what is measured in the traditional accounting systems. Maintaining these valuations calls for more analysis of the information affecting these value drivers, and should the accountants disregard this change and not provide investors with relevant information and data, they might begin to look elsewhere.

Digitalization in this paper is treated as the movement towards automated systems which has the potential to replace manual labour while improving the accuracy of data and minimizing the risk of data flaws. ERP systems also had the intention to automate a lot of processes and by making use of computerized systems the accuracy of analyses was improved. However, where digitalization stands out the most is in the way it forces the companies to adapt to the changing behaviour of the customers. Digitalization is therefore not only affecting the back-end processes but also, perhaps to an even greater extent, the front-end business. Through the digitalization of the society, meaning the customers and the overall technological innovations, e.g. smartphones and other internet connected devices, is enabling the option to analyse much more data – more specifically Big Data. According to Gartner, the definition of big data is:

High-volume, high-velocity and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making¹.

¹ <http://www.gartner.com/it-glossary/big-data/>

High-volume, high-velocity, and high-variety should according to the authors fit the work of the accountants fairly well and management of this data is not a novel concern. As we have seen, the accounting has always been indulged in large data sets with information stretching from financial to non-financial in nature, and there has always been a need for fast and timely analysis. According to Vasarhelyi, Kogan, and Tuttle (2015) digitalization differs from the previous innovations in the way it offers automation of information collection and how it opens up for analyses on a more diverse set of data. For example, analysis of customer's click path on websites provides insights in how the customer interacts and gather information which consequently affects the decision making and product design. This is claimed to make people from management, marketing, IT, and accounting involved in each other's work. Furthermore, real-time data will be possible to provide for other organizational members which was not possible when surrounded by the periodic nature of the traditional data. Nonetheless, things are perhaps not as easy as they sound, Quattrone (2016) discusses the need for more sceptical accountants and argues that systems and processes can and should not work on their own. The author criticises the progressive nature of digitalization and is worried that automated processes threaten the dialogue and discussion, something that financial planning in the traditional systems encouraged. Payne (2014) addresses this and highlights some of the strengths and weaknesses of automation and big data analysis:

“Automation makes processes less visible. For example, in the past people along the supply chain would speak to each other, now a button is pressed and the order is processed automatically. This is fine until something goes wrong and people do not know who to speak to, how to fix the system or how to do things manually. On the other hand, big data and analytics should provide opportunities to better understand a business and its customers.” (p. 494)

However, one thing that might pose a problem with big data is that the accountants might not be used to work in an abductive manner (Arnaboldi et. al. 2017). Big data analysis compared to traditional data analysis takes a different path, it requires an open mind where the business question is set, but later iterated on when new information is gathered. This is perhaps contrasting to what traditional accountants are comfortable with. Still, Payne (2014) argues that even if the analysis of big data does not fall under the finance function, there will still be a need to put a value on the collected data. Thus, in order for accountants to remain relevant, relevant information has to be analysed and taking on big data seems to be the solution.

The article by Arnaboldi et. al. (2017) provides a survey of the current state of the literature related to big data and the finance function and recognizes that with the technological advances and availability of big data analysis, we are facing a revolution that will change the way companies operate. Bhimani and Willcocks (2014) state that:

“the transformation of accounting information has been, so far, a slow train coming, but as the new technologies are increasingly applied they will accelerate the rate of change” (p. 495).

However, there has been relatively little empirical research on this area. This research field lack empirical evidence of the digitalization journey many companies are experiencing. We therefore answer the call to investigate how the finance function in four companies is involved and what progress has been made in this revolutionary technological shift. Little research has been done on the outcomes of digitalization, more has been focused on what potential processes and efficiency gains organizations can obtain. We want to provide insights into the real world and show what four different companies are dealing with, and how easy or difficult is it to make this revolutionary shift. What are the actual opinions surrounding digitalization of the finance function. It is important to shed light on the learnings companies have experienced as this will help other companies adjust their own business. With empirical evidence, we seek to solve this because without it, important wisdom might be forgone. The research question then becomes:

What is the position and role of the finance function in a digitalized environment where manual work is no longer needed?

2.2 Power distribution and adoption of accounting techniques

While the broad question of this paper will be directed to the finance function and information systems, we will assume a contemporary perspective and focus on how new developments in technologies will affect the position of the accounting profession and consequently where the finance function is heading. To make this analysis, we will present theory on departmental battles and hybridisation since this collection of theory will provide guidance and help us extend the current research by adding a new layer of complexity in the battle of relevance.

2.2.1 Departmental battles

From the outside, companies appear united as they strive for their set-out goals and objectives. On the inside however, different organizational functions such as accounting, sales, top management, and IT are both helping and competing with each other. The article by Newman and Westrup (2005) discusses this and shows that the implementation of ERP systems was an ongoing, dynamic interaction between the ERP system, different groups within the organization and external groups, such as shareholders or management consultants. Previous studies have therefore developed a number of models, trying to understand and describe these tensions among the different groups. Most notably using and further developing the technology power loop introduced by Scarbrough and Corbett (1992). The technology power loop is a simple and recursive model explaining how expertise is reproduced and how it influences the development of technology, which in turn shapes the control over it and with that defining expertise again. Newman and Westrup (2005) implemented ERP into this model and for a long time, that seemed to cover the topic. The management accounting and the IT department working mostly as a support and back-end for the business operations became stale and somewhat rigid. While the technology power loop illustrates the internal challenges and what goes on within organizations, it provides us with an outdated picture of the modern finance function and it does not capture the added complexities of digitalization. The model assumes that the roles of the different departments are fixed and that the knowledge is kept within the respective function. To make it more relevant and adjusted for today's challenges we turn to the concept of hybridisation.

2.2.2 Hybridisation and polarisation of professions

Notions of how different professions adjust to one and other is discussed by Kurunmäki (1999). More specifically, the article investigates the Finnish health care system during a period of change in the 1970s and how accounting practices were adopted to meet the new demands of the Neo-liberal ideals. During this time, emphasis was put on market forces and the legislators allowed the market to become the regulator. More power was thus attributed to the medical financiers rather than the medical professionals. The power shifted due to external and inevitable political movements, and the response by the practising doctors was the adoption of cost accounting. Awareness of cost enabled comparisons between the different health care providers and accounting was also thought to enhance the efficiencies of internal processes. Accountants together with medical experts could potentially start to standardise and increase accountability in terms of cost

and prices, and many started to believe that the future of the health care was depending on accounting practices and its development.

The article by Kurunmäki (2004) builds on her previous study (Kurunmäki, 1999) and questions whether management accounting should be regarded as a profession and instead be treated as a craft, meaning that the accounting is no longer restricted to a specific function. This is illustrated by seeing that the accounting information is being used in other areas with increasing significance and usefulness. During the New Public Management reform in Finland, Kurunmäki (2004) investigates how the medical profession adopted accounting practices, a phenomenon the author calls hybridisation. Scarce resources called for more precise accountability on a unit level which was achieved using accounting techniques such as: budgeting mechanisms, detailed documentation and reports. Even though the financial department of those units could prepare those budgets, the process itself created commitment by the clinical unit staff. The success of the initial experiments fuelled the hybridisation process, managerial activities such as pricing and costing were adapted by the medical staff. The author means that doing accounting was now becoming a part of the doctors' day-to-day activities. In the UK however, strong accounting associations were in place and hindered the dispersion of the profession.

Jacobs (2005) joins the discussion of hybridisation and explores an alternative form called polarisation. Instead of assuming that the collective profession (in this case the medical profession) adopts new financial and accounting related responsibilities, polarisation propose that new sub groups of the profession emerge while the wider profession remain unchanged. Jacobs (Ibid) finds that the conclusion drawn by Kurunmäki (2004) holds - to some extent - across multiple countries: German, Italy and UK. In these three countries, the usage of accounting techniques seems to indeed vary with the "*respective power and status of the accounting profession*" (p.157-158). Contrary to the findings of Kurunmäki (2004), in the German and Italian case, not all doctors embraced accounting techniques, instead, clinico-managers surfaced and took on management accounting and learned about accounting information and budgeting, speaking in favour of the phenomenon of polarisation rather than hybridisation. As noted, the hybridisation of the medical profession seems to occur in close connection to poor economic conditions and changes in the overall market. Thus, scarce resources appear to produce the need for new roles that aim to combine and consolidate different tasks found in an organization. When knowing the potential of the digitalization, how it can replace manual labour in the finance function with systems, it seems reasonable to assume that

hybridisation of roles could take place and consequently impacting where the finance function will position itself in a digital world.

We see similarities between the literature covering the development of the accountant to become more involved with other business areas i.e. to become a business advisor (Mourisen, 1996; Scapens, 1996; Grandlund and Lukka, 1997; Allot et. al., 2001) and the abovementioned literature on hybridisation (Kurunmäki, 1999; Kurnmäki 2004; Jacobs, 2005). Both discuss changes to the role of the accountant and show that the knowledge is being transferred to other areas within the organization. Where they differ however, is in how far this development has come. In hybridisation, the change has come full circle, the accounting knowledge has been transferred to other professions and areas in the organization and we deem that this is a necessary step for the accountants in surviving the digitalization of its function.

To conclude, the battle of relevance taking place inside organizations might not be as straight forward as depicted in the article by Newman and Westrup (2005), instead we argue that one must consider hybridisation and polarisation when seeking to understand departmental battles. They add a new dimension by showing how it changes the configuration of the organizational functions. External events and changes in the context where the business exist should be incorporated. We believe that this will open up for a new perspective which has the potential to explain the future developments of the finance function.

2.3 Theoretical framework

Our review of current accounting research on the state of finance function shows that technology is the driver of changes in the finance function. It plays a significant role in the development of new accounting techniques and systems, such as the ERP system, and played a crucial part in globalization and growth of companies. However, these new techniques and systems only changed the finance function itself and helped with better cost allocation or easier consolidation. Digitalization, on the other hand, is changing the whole business environment. It affects the front-end as well as the back-end of the companies and thus the whole digitalization journey is focused around the IT department.

As problematized in 2.2.1 there appears to be an increasing tension among different groups within the organization, which is even more prevalent in the context of digitalization, where the IT

department clashes with other departments in order to gain more control over the whole process of implementing new technologies. However, as was examined in a study by Granlund and Malmi (2002), there was a resistant behaviour of the finance function during the ERP implementation era. We observe a very similar issue during the digitalization. The research in the field of accounting is less precise on how the digitalization affects the core accounting purpose and is more focused around the big data analysis and the change of accountants' role. This can be understood from the perspective of a finance individual, but from an accounting perspective, it is not evident what roles and objectives will remain in the finance function when it is completely digitalized and whether the control will stay within the finance function or it will shift to the IT department. Additionally, some upcoming changes have been theorized in article by Arnaboldi et al. (2017) but here we identify a gap in the accounting literature since the articles are only conceptual and do not provide sufficient empirical evidence.

Following the Newman and Westrup's (2005) changes to the technology power loop model developed by Scarbrough and Corbett (1992), we propose another change to accommodate the digitalization journey. We look at the individual powers and we seek the answer to what agents are involved in the expertise, development, and control of the technology. However, we observe an on-going departmental battle between the finance function and the IT and hence we want to analyse who controls the technology and how the hybridisation changes the technology power loop.

We develop a theoretical framework which will be used to analyse our case studies by integrating the domain theory of development of the finance function and the effects of digitalization journey on the finance function with a method theory of technology power loops and hybridisation. Empirical data on the current position of the finance function will be investigated through the lens of the power loop, which will help us determine how far the companies have come on the digitalization journey and determine the effects of the hybridisation as well as proposed future of the finance function.

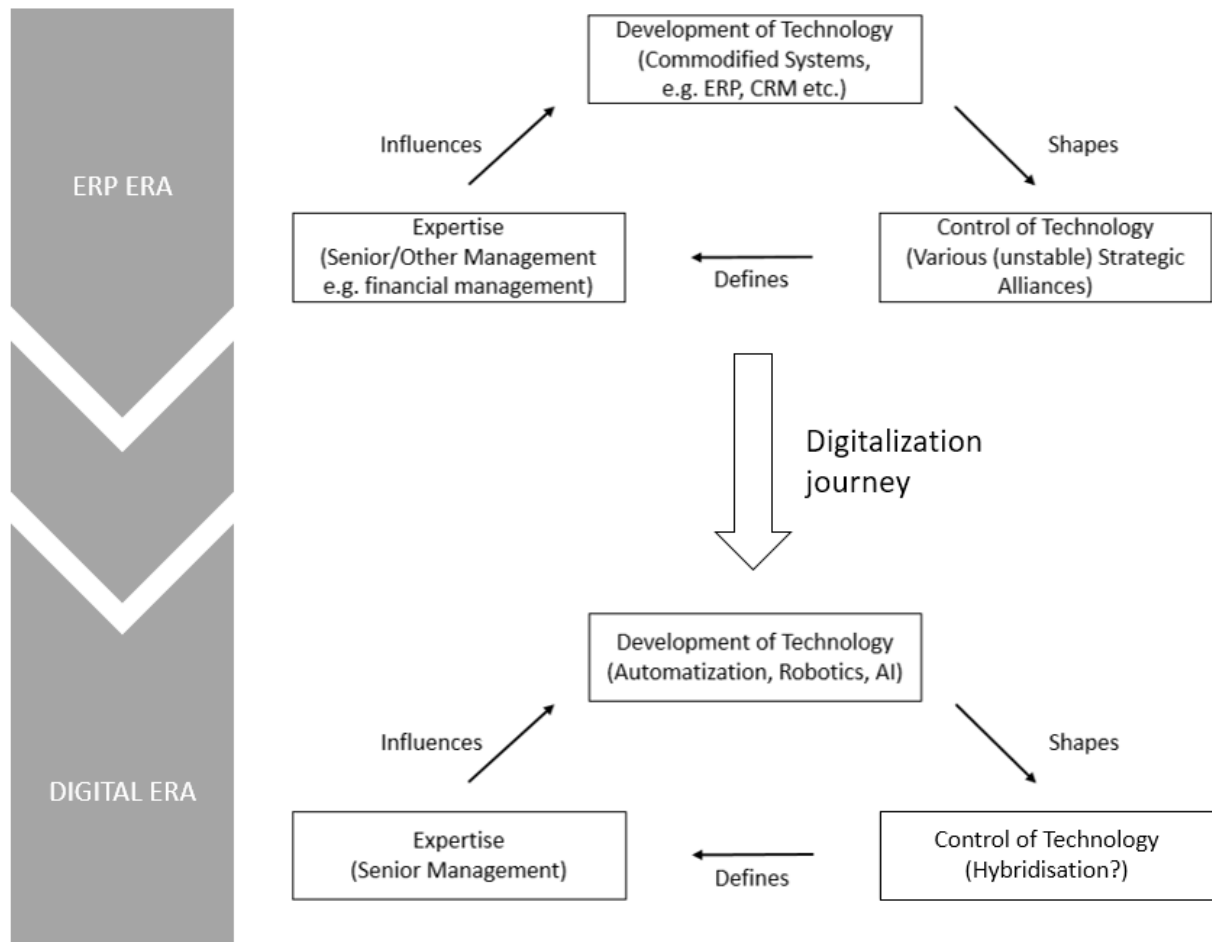


Figure 1 – Theoretical framework: Newman & Westrup (2005) power loop and the development caused by digitalization

3. Methodology

In this section, we describe the method for and our thought process behind the thesis. We start by going over the research design, then, we describe the selection of companies and the motivation for that selection and we also describe how we collected the data, and lastly, we move on to talk about the analysis process.

3.1 Research Design

3.1.1 Empirical Method

We chose to investigate the digitalization trend by conducting an explorative multiple case study in accordance with suggested research methods in management accounting and control (Otley and Berry, 1994). This allowed us to map the landscape and study the current state in four companies (see table 1) and to see how digitalization is dealt with in different companies (Eisenhardt, 1989). After searching for literature covering this topic we found that this field of research is new and little focus has been on how the finance function will be affected by digitalization. We therefore classify it as a nascent research field and consequently use a more appropriate qualitative multiple case study rather than a single case study or quantitative (Edmondson and McManus, 2007). This allows us to get a better understanding of the current progress of the digitalization phenomena in a complex business setting. It provides an in-depth observation of diverse established companies that are subject to different levels of digitalization within their respective industries.

Company	AirCo	BookCo	HotelCo	TellCo
Industry	Airline	Publishing/Retail	Hotel	Telecommunication
Year Founded	1946	1832	1990	1853
Ownership	Publicly traded	Private	Private	Publicly traded
Location	Global	Global	Northern EU	EU

Table 1: Company comparison

We started the research in the case companies without a predefined hypothesis and theoretical framework in mind. Instead, the hypothesis and goal of the thesis was formulated throughout the research process and nothing restricted us in terms of the methodology. Because of this, we would classify the research process as emergent in nature. Even though one can argue that a predefined

question can guide the research in a qualitative study, we believe that the data collection was conducted in such a manner that allowed for this gradual approach.

3.2 Data collection

3.2.1 Selection of companies

The data used for our study consists of 16 interviews in four companies. The case companies, which are anonymized as TellCo, HotelCo, BookCo, and AirCo, have their own setting and specific context. Even though no company asked to be anonymized we decided to do so to keep the focus on the findings and not to judge whether a certain company is good or bad. We are interested in these companies because none of them is reminiscent of the other and each has different settings that will determine to what extent digitalization affects them. In addition, we are also interested how digitalization pose organizational change differently to other innovations such as the implementation of ERP systems.

Leading up to the interviews we had some ideas of what we could expect. We thought TellCo would be interesting as a case company in the sense that it is a technology company and therefore presumably, digitalization would be deeply integrated. On the contrary, we expected BookCo to present a case of low level of digitalization and technology involvement. BookCo is an old company so it has a long legacy which we believed could bring valuable insights into how organizations deal with heritage. AirCo interested us because of its connection to other countries and thus the inclusion of interaction with other parties who might not have come as far in the digitalization process. Lastly, HotelCo was chosen because of its traditional nature but also due to the different niches a hotel can offer, we figured we could look at how the finance department can aid in the customization process when digital tools are at the disposal. When aggregated, the company selection lays the ground for a broad understanding of how digitalization comes into play for the business and more specifically the finance function. Also, we feel that having a variety in the company selection increases the credibility of the results since they are not limited to one company or a certain industry. The companies' structure is not unusual and should easily be found in other companies.

3.2.2 Interviews

The companies were contacted and informed that our thesis would have a focus on digitalization and the finance function, and that each interview would take approximately 45-60 minutes. All interviews took place between May and June 2017 and 15 out of the 16 interviews were conducted face-to-face, one interview was done through a voice call. While we did not have much control of who we would interview we asked them to look for people involved with digitalization processes from 4 separate areas in the organization. The roles ranged from front- to back-end: market and/or sales representative, business controller or other person involved with analysis of (big) data, CFO or equivalent role, and IT or someone in control of technology development. The idea was that this selection of individuals would give us a broader perspective on the topic of digitalization, such as: what is driving the change of the digitizing processes and how does the organization react to changes in one area – be it front-end or back-end, and in what way are they connected? Does it differ in across industries?

We did not send any preparation material to the interviewees beforehand because we wanted to avoid any rationalized stories that could have been influenced by corporate policy. Instead, we aspired to create a good atmosphere for conversation and wanted to hear their perspective on digitalization and how they and their role have been affected by it. Rather than probing different presumed statements regarding digitalization, open-ended questions played a key role during the interviews, it helped us to get a better understanding of the current state in the companies without the possible distortion of our prior experience or knowledge (Edmondson and McManus, 2007). The interviews were semi structured which allowed us to prepare the interviews in advance so that we had a good starting point for discussion. We also allowed the interviewees to talk freely and bring up issues or topics we did not expect.

3.3 Data analysis

The semi structured nature of the interviews also helped us with the comparative nature of the thesis – we determined an overall focus of the interview and looked for similarities and differences between interviewees and companies. The data collection and data analysis took place in parallel (Dubois and Gadde, 2002). While the data collection took place, we transcribed the recordings and analysed the data from interviews we had already completed. This allowed us to interpret and reflect on the interviewees' statements and stories. The reflection made it possible to further refine the

questions so that during the remaining interviews more time could be spent on relevant topics instead of waiting until all data is collected (Merriam, 2002), a process suitable in nascent research areas (Edmondson and McManus, 2007). Furthermore, we tried to schedule interviews with the sales people first in respective case companies in order to get a general sense of the company and its digitalization of the finance function. Because of these adjustments, no follow-up interviews were deemed necessary. All interviews were recorded and transcribed.

After all the interviews had been completed, we organized the empirical findings in a table based on polar types (Eisenhardt and Graebner, 2007) so that important findings and common themes could be identified (Yin, 2013). The table was then divided into different accounting oriented themes, all of which related to digitalization. This process enabled us to get an overview of every company while it also served as a foundation for further investigation of the linkages between the companies. Secondly, these themes were analysed based on the elements of the theoretical framework. We have matched our empirical evidence observed in the case companies with the theoretically predicted phenomena of hybridisation in our theoretical framework in relation to the Newman and Westrup's (2005) power loop. This allowed us to position the case companies in relation to each other as well as to see the overall progress of the companies in terms of digitalization of the finance function. Additionally, findings from the data analysis were being continuously discussed with the previous research, enabling a theoretically founded analysis of findings leading to potential contributions.

	Interviewee position	Company	Interview Date
1	Sales	HotelCo	May 12, 2017
2	Business Controller	HotelCo	May 12, 2017
3	Sales	TellCo	May 16, 2017
4	Group CFO	TellCo	May 16, 2017
5	IT	TellCo	May 17, 2017
6	CFO Norway*	TellCo	May 18, 2017
7	CFO	HotelCo	May 19, 2017
8	Business Controller	AirCo	May 26, 2017
9	Sales	AirCo	May 29, 2017
10	CIO	AirCo	May 31, 2017
11	IT	HotelCo	June 1, 2017
12	CFO	AirCo	June 7, 2017
13	Sales	BookCo	June 19, 2017
14	Business Controller	BookCo	June 20, 2017
15	CFO	BookCo	June 22, 2017
16	CIO	BookCo	June 27, 2017

*Skype interview

Table 2: List of conducted interviews

4. Empirics

We have analysed the interviews and ordered them by themes according to our research question in order to provide deeper insight into the relationship between finance function and IT of the company. We have found that even though everyone at the organizations is talking about digitalization, oftentimes the management is not willing to take the necessary steps in digitalizing the accounting and finance of the company. Remarkably, this behaviour was found within all of the observed companies. While there were some differences, most notably at TellCo which is the most digitalized company, all the companies see the benefits of digitalizing and automatizing their finance function and accounting and yet there have been very little changes within this department.

In order to investigate this behaviour, the empirics are divided into three main chapters following our theoretical framework while giving clear links to the theory of the technology power loop, namely the control, development, and expertise. Additionally, we included some other findings to give a broader perspective on the issues as well as possibly explain some phenomena that arose during the interviews. The empirical findings are therefore structured as follows:

1. Control – What is the current relationship between finance and IT?
2. Development – What is the perceived future of the finance function?
3. Expertise: Hybridisation – How has the finance function changed in order to accommodate new trends and issues?
4. Culture and other findings
5. Concluding remarks

4.1. Control over technology and digitalization

The digitalization of the companies can be simplified into two parts – digitalization of front-end and back-end. Whereas digitalization of the front-end revolves mainly around products, introducing either a completely new digital product or some changes to how the product is bought or delivered, and services related to the product, e.g. marketing or sales, digitalization of the back-end is primarily concerned with transformation of the support system for the operations, e.g. processes within the company or digitalizing the finance function itself. All four of the companies have their front-end fairly digitalized. BookCo introduced a new line of completely digital products, AirCo is shifting towards a “lifestyle company” offering additional services and providing a different experience for the customers, HotelCo simplifies the way the customer orders a hotel

room via an app, and TellCo is operating in a very digital industry – offering more wireless services and reducing the need to contact the customer service and instead quickly figure out and solve the problem via a smarter and more to-the-point interface.

In contrast with the digitalized front-end, there are more severe issues and difficulties regarding legacy systems and old or incorrectly set up processes. Digitalization then does not only consist of digitalizing these processes but in a broader sense it also consists of correcting these processes in order to fully transform the legacy systems.

“When you have an underlying process problem, you should not digitalize that. You should actually have a correct process before you start. Everyone wants an efficient system that’s going to fix everything but we still have problem that 30 years ago we didn’t have computers etc. and now it’s more of a process question or organizational question. We need to define who does what at what time to provide good information and then with an IT system, it’s easier to correct system and make adjustments quickly etc. but it’s a problem here if we have a process error.” (AirCo, Business Controller)

“The job is to store and structure the data, so that we know exactly what kind of information we have. And that is an issue we have right now, with the old systems, we need to make the transition to new systems. In a digital world you don’t expect it to be any flaws with the data. It should be flawless information going through the systems and everything should be real-time, so it puts a lot of pressure on the architecture.” (HotelCo, CFO)

In addition to that, the finance function seems very reluctant to change, which makes digitalization even more difficult for the IT department within the company. There are new technologies emerging that could potentially replace the whole finance function as it is right now, completely automating the “data crunching” with a functional AI. The speed of development and the level of implementation of said technologies is, however, still being questioned and discussed and thus we observe an on-going battle between finance and IT. In addition to that, the finance function wants to remain in control of the technology contrary to IT department that would be taking over it after the complete digitalization. We studied this behaviour in order to find the more dominant department in each company, which in turn helps explaining some of the structural changes and decision making around the digitalization within these companies. The structure of the table 3 follows the key steps in the article by Schäffer & Weber (2016) with data management as the key challenge in digitalization. Fundamentally, the department that oversees and controls the relevant

data is also in control of technology. Despite that, having IT in control of technology does not imply that the company is more digitalized. We observed a 2:2 split, however within each block there was one company more digitalized than the other one (HotelCo and TellCo, respectively). Both of them follow a similar pattern – unrestricted access to information throughout the company, automated processes, and making a better use of the available data.

CONTROL OF TECHNOLOGY

More dominant department	FINANCE		IT	
	AirCo	HotelCo	BookCo	TellCo
Data management	Fragmented ¹	Finance	IT	IT
Information access	Through Controllers	Unrestricted ²	Through Controllers	Unrestricted ²
Agility and forecasting	Controllers; slow	Automated; real-time	Controllers; slow	Mostly manual; frequent
Efficiency	Very basic; inefficient	Automated processes	Some processes standardized	Automated processes
Big Data Analytics and/or the task of finance function	Mostly within the sales & marketing department	Using the forecasting tool for better market analysis	Analysing the financial consequences of digital products	Contextualizing the data

1 Different departments are in-charge of their specific data, e.g. sales in-charge of customer data, HR of personnel data, etc.

2 Information is not kept within the controlling function and can be accessed freely within the company

Table 3 – Control of Technology

But even with more dominant finance department, we still did not observe any major advancements in digitalization of the finance function and with the digital products and the new IT possibilities, the question remains unanswered. Why did the finance function not change alongside the front-end? The question can further be broadened by looking at what is now the finance function's current state and what is its ultimate objective.

The issues mostly arise from the fact that only very small changes have happened to the finance function and that the anticipated digitalization has not been implemented yet or only some very basic manual processes have been automated. This can be explained by the fact that the “*customer of the finance function*” is essentially the organization itself and if it does not see the need for a change of outcomes of said function, the incentives are not there. This explanation has been suggested by the CFO of HotelCo.

“The finance part is still a bit too slow, we look at the quite old fashioned processes that we have and see which processes are suitable to be automated. Luckily enough, the needs of our customers from the finance part don’t shift as quickly as the needs of the end customer.”

Digitalization of the finance function seems to be hindered primarily by the economics of implementing newer systems. Most of the companies have already undergone change to the accounting systems not so long ago when they were implementing ERP systems. The world and the business environment has not changed drastically since then and changing the finance function again in such a short manner of time proves to be an unjustifiable and unnecessary cost. And while the management accountants are aware of the long-term benefits that the digitalization can bring to the companies, old organizations with legacy structures that are operating on very small margins, e.g. AirCo or HotelCo, cannot afford additional costs by implementing a new system that does not bring any new revenue streams. Or there is simply no competitive need to have faster and digitalized accounting. This has been agreed on by all the case companies.

“I tend to look at our processes from a more: how do we do this in the most cost efficient way. Digitalization is not economically viable, so we don’t do it, maybe tomorrow when it is more economically viable.” (BookCo, CFO)

“CFO is highly concerned at the moment that we need to get value on our investments. We’re not doing anything, no major things on our accounting systems at the moment ... So we have this continuous improvement but we are not actually at the moment replacing our accounting platform, our financial system.” (AirCo, Business Controller)

“...also the fact that nowadays we balance the books every month, so there is a need for more speed I would say, but at the same time I think we are able to cope with it” (IT, BookCo)

Another obstacle seems to be the issue of stability and risk. In an unstable business environment that is changing very fast, finance function always served as a balancing counterpart. Its stability makes forecasting and planning much easier and implementing a new system, potentially endangering this stability in favour of small benefits when handling bookkeeping or accounting per se, is an unnecessary risk. There is a potential in exploiting this trend which we can see in e.g. modern low-cost airline companies, but this threat is not endangering the “classic” business and

only focuses on smaller customer groups that usually cannot be catered for by the old companies that we are inspecting. From the interviews we can assume that once the business environment stabilizes or the pace drops down significantly enough, there will be tendencies to digitalize the accounting. And while it may seem that the companies are not essentially willing to change, it is still prioritized which can be observed on the changes in structures of the companies, be it creating of new teams and designating specific departments for the IT changes or changing the responsibilities of e.g. the CFO, which is more specified in the chapter 4.3.

“Digitalization is very prioritized. AirCo didn’t have a CIO in the team, now we do. If you read annual report, there’s a lot of information about it, it’s not our core business but an enabler. I’d say top 3 priority.”
(AirCo, Business Controller)

“I think the role of the CFO at BookCo has changed very much. You meet Mr. X, he was the former CFO here at BookCo, and he is not what you call the traditional CFO.” (BookCo, IT)

Besides poor return on investment (or having unnecessary costs with already small margins) and the issue of stability, other reasons include the issues with the legacy system and more conservative culture of the finance people. The former is a problem related to the issue of small margins and poor ROI. In AirCo’s case, the system and processes were developed pre-internet era and for them automating these processes is no longer within the realms of possibility. These legacy systems were built in a very specific way and the companies kept adding on additional layers as the time went on. The implementation of ERP systems have eliminated some of the old processes and replaced them with more automated system but it could not solve every problem. Even TellCo, the most digitalized company among the four chosen companies, has relationships and operations that rely on some parts of these systems, which makes the transformation even more challenging. The digitalization of the finance function thus face a difficult dilemma – to completely replace these systems with a new more automated one or to transform old processes when it is necessary and make them suitable for modern day use.

“I think that we are one of those old Jurassic park companies when it comes to financial planning. We have changed a lot there but still, we have just gone from poor to medium/ average in the world and we want to take the next step. We have very separated processes for closing the books running the forecast planning, which has been sort of medieval, and then the closing the books has been close to best in class.” (TellCo, Group CFO)

“From a financial perspective we have several concerns, on the legacy or operational side it’s difficult to take out costs when we have a lot of locked in established relationships. We have lots of single service providers, you enter into these relationships to get a scale effect and to get a lower cost and that’s probably good but it also means that it gets more static and it’s difficult to change it quickly.” (AirCo, Business Controller)

The conservative and more sceptical culture of the finance people is more explained in 4.2 and 4.4. The finance function tends to see itself as very important and is unwilling to change its core purpose or to implement any changes affecting the established processes. The finance people see the benefits of automatic processes, however they are very sceptical about having an IT system replace the function entirely. This leads to a very conservative culture among the finance function that does not mind being the “late bloomer”. This is also correlated to the IFRS requirements since one crucial part of the finance function is the reporting. The current systems are better adopted to the current IFRS requirements and transforming the function could potentially create reporting issues. However, with products being more digital and inventory tracking becoming a strange enigma for some of the companies, e.g. limitless inventory of BookCo’s digital product offerings, there might be some upcoming changes to the reporting itself, which could potentially be followed by the changes in the finance function itself.

In conclusion, digitalization is prioritized, however the talk is only around the front-end, the products or other parts of the companies, not the finance function per se. This is not surprising as we have seen in the past (with previous two IT trends – functional and ERP) that the finance functions are “late bloomers”. Two questions arise: what are the problems and what are the opportunities for the late bloomer finance function? The biggest problem lies within the delayed investment and economic viability. The companies are trying to become more agile and more dynamic with their processes but they often fall short having obsolete finance function. This leads to a discussion whether an investment into finance is necessary which, given that it remains unresolved or deemed unnecessary, gives potential opportunities for newcomers that might exploit this. However, having a delayed finance function brings a sense of stability and reduces potential business risks. With a late blooming finance function, there’s also an opportunity to ease a potential cultural shift, explained more in detail in the chapter 4.4.

4.2. The development of technology and the struggle of finance function heading into the future

Among the four case companies, we observe an ambivalence. On the one hand, they are all aware of the benefits in digitalizing the finance function, but on the other hand, the changes made to the accounting are abysmal, if any. We wanted to inspect what is the perceived function of the finance people in the companies and what functions are believed to remain within the function. Looking at the current situation of the finance function among the companies, we found many similarities and except for TellCo, there are surprisingly very small differences across various industries. There are, however, variances in what different companies or different people within the same company think of the future of the finance function.

“We see big opportunity to automate the transactional tasks so you can reduce the total amount of people necessary to work within the finance scope significantly.” (TellCo, CFO Norway)

The “battle for control” between finance and IT overlaps even more into the future. Seeing the exponential growth in technology and how quickly the digital world is developing, there is no doubt that more and more business operations and processes will be digitalized. To fully understand the effects of digitalization, it is important to outline three levels of digitalization – automatization, robotics and AI. Automatization is the most straightforward and digitalizing the back-end makes the company more efficient and at the same time creates more customer value. Automating processes is reflected more on the transactional side while visualizing the data works as a new tool for finance, requiring less time for implementation, providing more insight and analytics, which is beneficial for decision making. Using robotics can be a good way of improving measurements, be it customers using digital channels or automated processes. It also works well for making better use of the enormous amount of data that the companies will be collecting (or, such as TellCo, they already are) and generating more informative outcomes for decision making. While automatization is basically replacing manual work with automatic scripts and processes, robotics make use of this automatization and can significantly improve the speed of generating relevant conclusions from the data. AI is the most advanced technology and it will take time to fully implement because it needs both automatization and correctly setup robotics in order for it to be completely efficient with self-learning mechanisms. Even though the technology is still being developed, there are tremendous improvements in how the AI works and albeit the costs of implementing such system will be extremely high, the long-term benefits are undeniable. It is important to note that the levels

of digitalization follow a pyramid scheme and that the higher levels cannot work without the lower levels already being in place within the company (see figure 2). That is also one of the reasons why the opinions on digitalization of finance function differ. The figure also includes recent focus of the finance function on a better visualization tools, which are affected by the automatization since there is a better access to real-time data. The visualization tools in turn create more appropriate and better KPIs that affect the level of digitalization and its progress measurement.

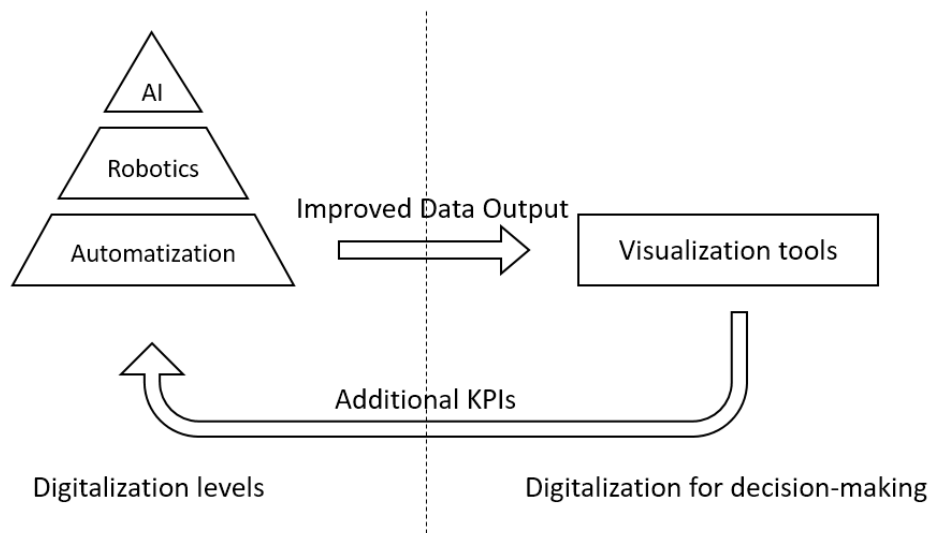


Figure 2 – digitalization levels

More often than not, finance people do not feel threatened as they believe there might only be a slight change in their function, focusing more towards analytics and advisory. The interviewees were generally aware of the possibilities but they mostly saw digitalization as an opportunity rather than seeing it as a bane of the finance function. In other words more manual jobs such as bookkeeping will disappear and the finance people will replace some consultant jobs. In general, they expect digitalization of the finance function to reach the second level of digitalization, i.e. robotics, possibly with some basic implementation of AI. They also believe that this change will take a very long time and that for the time being the only probable digitalization involving the finance function will revolve around the first level, i.e. automatizing some basic processes. This has been the case in HotelCo. AirCo has adapted few digital solutions but the processes themselves have not been digitalized. Opposed to that, TellCo has already started to experiment with robotics albeit their front-end implementation limits the impact on the finance function. They still do budgets and there are manual processes done by the finance people. See figure 3 for a comparison of the companies on a scale representing the approximate path from a company that has not been transformed to a modern and completely digital company.

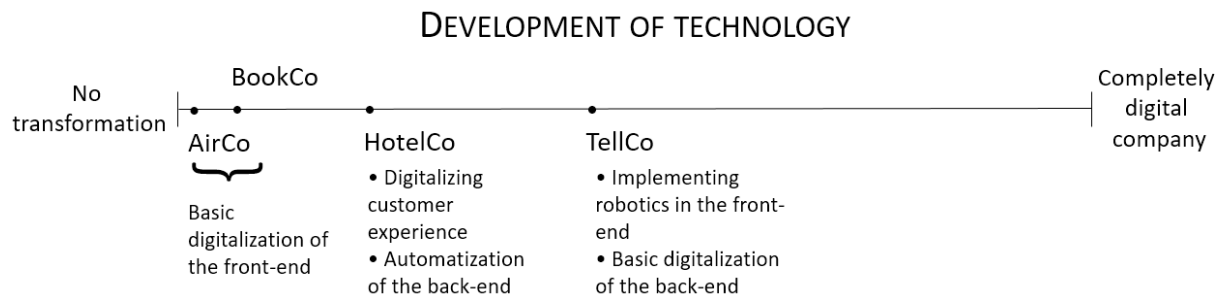


Figure 3 – Development of technology

In contrast with the opinion of finance people is the view of the IT section of the companies, particularly in TellCo. Understanding the trends and observing the exponential growth in technologies, the IT department feels being dragged down by finance departments and they believe the decisions could be made in a much faster way and that almost everything can sooner or later be replaced by machines. The necessity to change the finance function could be articulated by TellCo's CIO: *"yesterday was already too late"*, even though they are by far the most digitalized company.

"The finance function will disappear" (TellCo, CIO).

While it is expected for the IT people to know the possibilities of digitalization better than the finance people, they only view the finance function as the accounting and reporting. They are not aware of the changes and the hybridisation, as described in 4.3, and that the finance function is taking a different route. They however agree that with digitalization, or with any change per se, must also come a competence shift where some changes of roles and job functions occur, in order for the finance function, or what is left of it, to stay relevant.

"Digitalisation makes competence change more rapidly than it did before, the competence you have today might not be good in a year... You might need something else. Labour is so expensive and it can't be that static anymore, we need to be able to have some flexibility in order to withdraw and to take in something new." (HotelCo, CIO)

"I agree with the proposition that the finance function is going to disappear in the long term to some extent. We've moved most of our finance function to India. We still have some interactions with business controllers so we do have a bit of an accounting. But will the CFO function also disappear?" (AirCo, Business Controller).

A claim that stands out within the finance function since even in the not so digitalized airline company, the business controller is well aware of the probable upcoming changes. We asked the same question all the CFOs in order to see what the view of a more senior management is. Below are the answers.

“Some simple jobs might disappear etc. controlling functions or coding can be done smarter, to compare and retrieve the data from the system can be done faster. But nothing dramatically different. It will be an opportunity. But I think sometimes people exaggerate the possibilities because some people are not that skilled when it comes to understanding the numbers and the money so if people would be very educated, then yes, finance could be replaced but we certainly have a problem with that, we’re trying to educate people further down in organization on understanding the numbers better. But even with robust processes that are more automated it still needs to be overlooked by people.” (AirCo, CFO)

“There will be a massive transformation going forward and in an extreme case you don’t really have so much need for a finance function as it is today. The recommendations will more or less come up, the systems will just run the processes that will be automated. And you need a few technical guys with a finance understanding to keep the function going. I think the finance function should change dramatically and the question is how long time it will take.” (TellCo, CFO Norway)

“About IT and accounting I think, from one perspective, a finance function having people working in a finance function doesn’t have a purpose on its own, because a lot of things can actually be automated and will be more and more going forward. If you have coded that correctly there will be less errors, so this will be a big shift in every industry. ... From the accounting view, people will always make the analyses and make the business decisions and so on, as long as we don’t have AI that is far more advanced than we are, but the rest is just an effect of the business and we will need more flexible systems and that is something that has to change, because historically, in all industries ERP and accounting systems have been extremely rigid and it has been very hard to change.” (BookCo, CFO)

“(What do you see the future is for the finance function?) All the analysis part, where we still need the brain if we were to do some ad-hoc analysis where we need to predict things based on the information that you have, that you use all the information that is already stored, systemised and that you have things easily accessible. So for example if you want to go into a different customers segment you would like to be able to

split down and look at relevant information, I think that will be the most important thing - increasing the predictability.” (HotelCo, CFO)

In conclusion, the CFOs in general look at the finance function from an elevated perspective, they are aware of the AI implementation consequences for the finance function but they feel that for the time being only some manual tasks will be automated and that the finance function will still retain their analytical roles. This view is also shared by most other business controllers and market-side people. Furthermore the CFOs realize better how the digitalization will change the finance function in the future. It contrasts with the view of IT people who only see the finance function as it is today where they believe that it will inevitably get replaced by robotics and AI and it is only a matter of time when that happens.

4.3 Expertise shifts and the hybridisation of the finance function - late bloomer already adapting to the changes

Even though the finance function is very reluctant to adapt, there are already signs of changes. These changes are not necessarily linked to the digitalization of the finance function but there are new demands on the finance function and some form of hybridisation is an indirect effect of the world becoming more digital and processes more automated. In other words, digitalization is enabling hybridisation. Companies with modern tools and systems in place tend to look at the finance function and ask themselves what more value it can generate. This is reflected in a way that larger companies tend to have departments to some extent separated and the people working within these teams need to keep track of their budget and the various effects of their operations on the cash flows or the profit and loss statement. The finance function itself is losing its importance.

“Everyone needs to be a finance guy” (AirCo, Sales)

With the pressure on employees becoming more knowledgeable in finance, the finance function is transcending into a function that provides more information and analyses besides the regular bookkeeping and forecast planning that is now mostly associated with this function. Additionally, there is a need to contextualize and understand the data.

“The new revenue streams starts a lot of questions, where would we end, and how will this affect our business, and one big part of it is how will this affect our authors basically. Will they get as much money as they did before?” (BookCo, Business Controller)

The finance function no longer focuses only on getting a good analysis from the big data or predicting future market trends, inspecting the data and understanding the context and their meaning is the crucial objective instead. Contextualizing the data helps with the business operations or with decision making when new contracts are being proposed to suppliers. For BookCo, it is about understanding how the digital products, such as e-books or audiobooks, are used. BookCo is now able to gather a lot of data and the finance function has to make use of all the available information, e.g. when the customers stopped reading the book and whether they should compensate the authors accordingly. AirCo and HotelCo have to look at how customers order their services, how many web-clicks they make before they purchase their products, or how often they look at OTAs (online travel agencies) instead of using the company’s website. The finance function makes use of this information in order to appropriately price their products and services, help shift some strategic or marketing decisions, and to improve the reliability of their analyses and predictions. TellCo gathers the biggest amount of data and albeit it can only be used in aggregated form, there are some attempts from the finance function to not just contextualize this data but also to find more value within this data, e.g. giving the customer an option to sell the data to third parties.

Since the finance function is a “late bloomer”, it has yet to be affected by digitalization and there have been very little changes to its core purpose. It is, however, possible to split the finance function into its subparts – finance individuals and finance activities. While the finance activities are becoming more automated, i.e. more digitalized, the finance individuals’ answer to this trend is the hybridisation. See figure 4 for an explanation of how the finance function is digitalized and what parts are affected.

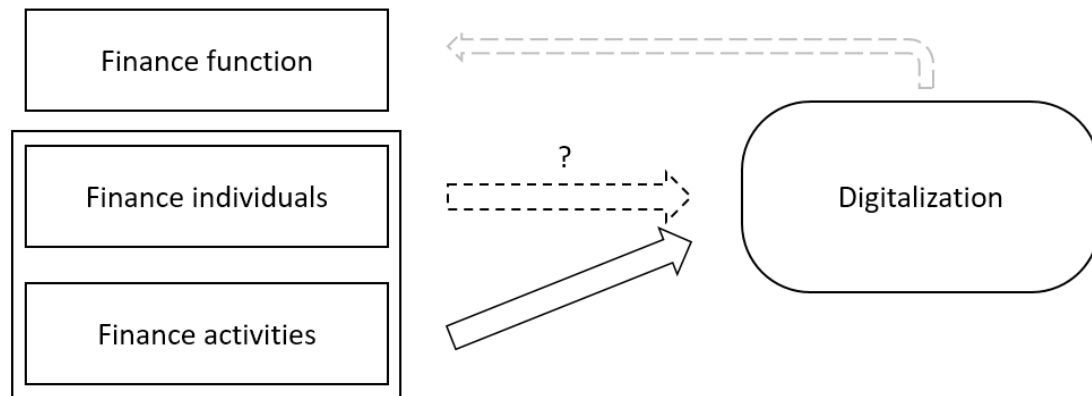


Figure 4 – digitalization of the finance function

In terms of hybridisation, we observed two major changes to the finance function. Firstly, there is a shift towards a strategic management.

“Well, if you look at traditional CFO, which is very finance oriented I wouldn’t say that I am typical CFO from that perspective, it is much more of a strategic side of things, in many organisation there has been a shift over a couple of years so you don’t see the CFO anymore in the piles of documents and going through the numbers, it is much more linking the actual business activities to the metrics and also analyse what comes out the bookkeeping. So my role is pretty much strategic, more of a COO role rather than a normal CFO.” (BookCo, CFO)

The companies are using the finance function to increase the predictability of events and potential threats and to influence or make better strategic decisions since this function has more and more data to work with and can better recognize market trends. This is an indirect effect of digitalization because it is not directly related to the processes becoming more automated rather the companies have access to more real-time data, which influences this shift.

“(What role has the finance function taken?) More analytic I guess. Now we actually have changes in our market, before it was kind of “the market is like this, do we perform well on it?” Then it would get up and down, but now it is like “so we have this stream here that’s gone from 0 to this in a few years, will it stay or will increase or will it decline?” then we have the other part, since I started here, since BookCo changed their CEO, it has become more strategic, what will happen in 3 or 5 years, going from what will happen next year - let’s do a budget. Now it is more like, will we have this type of volume there or will it be like that. ... But I think, the main reason for that is digitalisation, we have something now that we didn’t have before.” (BookCo, Business Controller)

HotelCo has developed a tool that shows the predicted and actual numbers of booked rooms and according to that HotelCo can be more flexible with cleaning the rooms and hiring appropriate amount of people for the upcoming months or days. It also directly updates financial numbers and accounts. This tool leaves very little room for classic accounting work and leads to the finance people in HotelCo focusing more on analyses, strategy shaping, or getting involved in project development. This was confirmed by the business controller when we discussed the changes and how the finance function tackles it.

“It’s a quite common problem, that you think of the customer side and that you forget the back end, and we have definitely had that kind of problem 5 years ago, now with those processes and the involvement finance has in, in terms of project development we think more end to end, but there is still a room for improvement.” (HotelCo, Business Controller)

Second shift is the hybridisation with the IT department. With the digitalization changing the front-end of the businesses, there is an emergent need for the finance function as well as the IT department to understand how the digitalization affects the financials. It does not just revolve around digital products per se as the product sold still affects revenues in a relatively similar way but tracking the inventory account or correctly allocating the expenses to the units sold can be challenging. BookCo has to establish new contracts with the authors since there are new formats available and getting a percentage of sales makes less sense with some products. Finance people have to get involved in order to make sure that the processes are set up correctly and for that to happen, there is a growing need to bring IT knowledge into finance and vice versa, which in the final form creates a new hybridised department.

“The role of the CFO has changed very much at BookCo. The traditional CFO is more used as someone who is very good with accounting and looking at figures in that way... that was not our CFO’s role at all. Of course that was a part of it as well but just being a part of driving the business forward together primarily with IT I would say. Understanding the needs of IT investments and also understanding what it can do. ... Looking much more to do thing more efficient, investment in IT and all that, an enabler to be able to make digitalisation happen not just looking at the bottom line and see oh that cost a lot, no thank you.” (BookCo, CIO)

But it is not just a change of the CFO role. The business controllers and accountants are getting more involved in the investment processes and strategy valuation projects. Such is the case of Business controller in HotelCo.

“My team designed the investment processes and how we ensure that we make the right decisions so we are more fact based, and today I am also a part of a large IT project – or IT strategy valuation project, and a part of the decision group that decides that we invest approximately 50 mil in it every year, basically deciding where does the money go to. So we in finance definitely have a role in digitalisation and that part.” (Business Controller, HotelCo)

In conclusion, hybridisation of the finance function can be observed as a way of finance individuals to digitalize the finance function. There is a shift towards strategic management, where there is a need to contextualize the data in order to form better strategic decisions, and additionally, there is a hybridisation with the IT department, where the finance function needs to understand the IT investments to better measure and allocate the costs and effects of the digitalization.

4.4 Cultural obstacles and other findings

Following up on the ambivalence mentioned in 4.2 (everyone being aware of the benefits and yet there is very little digitalization happening), one of the reasons (see 4.1) why the companies have not digitalized their finance functions is the conservative culture.

“Everyone wants a new system until they have to change. But the system won’t be the thing that changes our business, I think it is more of what customers want and we need to adapt to that as long as the volumes are there to make it work. So no, we are not system driven.” (BookCo, CFO)

When the digitalization is seen as a threat for the finance function, it is understandable that the employees would rather avoid this change that could affect their position at the company. Another explanation for the conservative culture is essentially “being comfortable with the current status”. Quite recently the companies implemented ERP systems and the finance people were the ones most affected by this change. Moreover if the core of the business is not financial services and operations, combined with the economics of investing into new IT systems, there are little incentives to change, especially if it could happen in few years again when more advanced AI networks get developed.

“We’re not an IT company like a bank today where everything is digital. The main costs are not IT related. You’re working with digital assistance but it’s not core. We’ve had objections to new systems, there are established ways of doing things so I would not take that as a given that we are more used to it than another company or a hotel chain. I don’t think we’re particularly bad but I wouldn’t draw a conclusion straight away.” (AirCo, Business Controller)

Surprisingly, when faced with the question of whether the interviewees believe if they are doing well in terms of digitalizing the finance function, the usual answer was that they feel they are quite behind and that they could improve the pace. The blame was thereafter put on the company culture or the economics of the investment. However, except for AirCo, which has to compete with new low-cost airline companies, none of the companies are behind their peers in terms of digitalization.

“It was because of the culture, we did not think that we could break the culture spell of budget until last year, but we did it and so now we don’t have a budget. Coming back, we are an incumbent and a traditional company, budget has been in this industry very very important, you have your yearly budget and you make it within that and then you are free sort of. And we are trying to kill that, which took us 2 years for Mr. X and myself to break the other things you need to break first before you start to implement this. So that is how we have been thinking around that. Reporting is not a culture thing, it is just a matter of getting it done faster. Back to culture, it can have a big impact on how to get 25k people to do what you want.” (TellCo, CFO)

“First of all, BookCo as a whole is not a company that is on the stock market. We are a family company, which is something to have in mind, but also the fact that we nowadays balance the books every months, so there is a need for more speed I would say, but I think we are able to cope today.” (BookCo, IT)

These were company-wide beliefs, which was to some extent agreed upon all the interviewees, even by the finance people. The reason for this phenomena lies within the inability to measure the progress of the digitalization appropriately since it is a very abstract and broad term, which is very difficult to benchmark. And even though there is a different level of implementation of the digitalization within the finance function among the four companies, the inability to measure the progress is a shared trait, making the companies operating in very different industries face a similar issue. This problem amplifies the above mentioned conservative culture because without correctly

set up KPIs or targets, it is very hard to grasp the idea of digitalization and make any adjustments within the function.

“(Do you set up targets?) Yeah we do, not that we have to reach this, more in terms of we think that we will end up here. Because in the change of digitalisation, we are not trying to steer towards it. We aren’t, the end number is not in our hands.” (BookCo, Business Controller)

“(Do you measure the progress with digitalisation?) Yeah, we try to do it a lot, we use google analytics, and measure it very tightly so for example in one project we have now, one of my business controllers has one employee that works with structuring of the data to get it in our data warehouse for our business intelligence tools. So we don’t need to have google analytics there and we have our other analytics in BI. And there is definitely a lot of deciding on what is the most important target to look at, what definitions do we use?” (HotelCo, Business Controller)

“We’re not good enough with KPIs, we need to have better view on how far we’ve come with digitalization and how well the digitalization meets customer and our needs and how it can be made more efficient from the cost point of view and that should be measured throughout the whole chain between yourself and the customer.” (AirCo, CFO)

The biggest contrast is between BookCo and TellCo, where the former is only steering towards a number that is believed to be beyond their control, and the latter is the most advanced in terms of progress measurement and they are the closest to have a thorough set of targets and KPIs for digitalization.

“You measure on financial performance and customer experience. Going down we’re measuring our digital customer base. The percentage of our customers using digital channels. That is one example, as an end result we’re looking at bringing customers from our customers care and retail over to self-service and digital channels, that’s an important part of it. We measure number of processes we set up with robots and how they can replace manual processes so there’s a mix of everything sort of overall KPIs down to specific KPIs measuring development.” (TellCo, CFO Norway)

4.5 Concluding remarks

While the front-end of the companies has already been digitalized to some extent in all four companies, the back-end, and more specifically the finance function, has yet to be digitalized. Even with an implementation of robotics in TellCo, there are still many obsolete processes and manual tasks within the finance function. We observe an on-going battle between finance and IT, where the latter believes that the finance function in its current form could be replaced completely by the machines and that it only slows the companies down. Even though the finance function seems very reluctant to change, there have been some forms of adaptation from the finance people. The purpose of the finance function is being shifted towards strategic management and it is increasingly important for it to understand the IT investments and to contextualize the growing amount of available real-time data. In other words, the companies started to demand more value from the finance function rather than just having a function that works solely on an accounting and reporting. Below is a table summarizing the findings according to the themes presented in the empirics.

	AirCo	BookCo	HotelCo	TellCo
Digitalization of the company	Front-end: easier customer experience	Front-end: digital product	Both front-end and back-end	Both front-end and back-end
Digitalization of the finance function	ERP-based	ERP-based (some automatization of COGS handling)	Automatization*	Automatization*
Form of hybridization	Advisory of IT investments	Strategic CFO – more decision making	Advisory	Contextualizing the big data
Progress Measurement**	Trying to find good KPIs	Targets only as a probable prediction of future events, not trying to reach it	Trying to find good KPIs	Mix of overall KPIs with specific KPIs measuring development
Culture	Conservative	Conservative, however the digital products are changing the culture	Established ways of working are being changed	Being digital is the nature of TellCo's industry

*HotelCo's and TellCo's finance function is still ERP-based with implementation of some form of automatization

**The KPIs in this table strictly revolve around progress measurement of digitalizing the finance function

Table 4 – Summary of themes across the companies

5. Analysis and Discussion

In this section, we will discuss the empirical findings against the theory we outlined above. We found that the companies are not prioritising the implementation of digital solutions in the finance function and they instead focus on other aspects of the business affected by the digital trend. The four companies we conducted our study on have shown an interest in the digitalization and in different ways implemented changes in the finance function. As we will see, depending on how we define the finance function and what it entails, different conclusions will be drawn.

5.1 Outcomes of departmental battles and the position of the finance function

5.1.1 ERP-based power loop model

Prior to digitalization, Newman and Westrup (2005) suggests in their article about technology power loops that ERP era basically set a power loop in the following manner. Control of technology (various strategic alliances of management and other groups such as vendors, consultants or IT-group) defines expertise (senior/other management), which influences development of technology that in turn shapes control of technology. This has stayed true when implementing ERP systems to companies. The CIO of TelCo provides us with a bold claim by saying that “the finance function will disappear”, and without contemplation of what it means, one might interpret it as that there will not be any needs for finance in a digitalised world. However, the statement simply highlights the importance of hybridisation between organizational groups. Namely, without speeding up the process of how the finance function is becoming more decentred and involved with other parts of the business, the companies are running the risk of setting themselves in a cumbersome position where they end up having a department that is not reaching its full potential and does not bring enough value.

What we need to keep in mind is that there will always be the need for numbers and financial data upon which investors and capital markets rely on. But the finance function as we know it today, might not be around to deliver those numbers. To illustrate this, we will first assume that the finance function will continue to exist in its current form and use the technology power loop to understand what position the finance function would have had. With new IT systems in place, particularly AI, there is a potential shift in control from management accountants towards IT department. While the development of new automated technology basically follows and copies old

financial systems still influenced by management accounting, it shapes the control of technology in a way where most of the financial analysis and trend prediction is done again by the same IT system, replacing the need for the more manual functions of finance. It then defines expertise which is still the same management, essentially skipping the role of finance in the company. Assuming that the finance function continues to exist in its current form, it would follow the same behaviour outlined by Granlund and Malmi (2002), who claimed that little impacts have the ERP systems had on the finance function and the accounting practice, and we would see a loss of its control over the technology, i.e. the accounting system. This can be explained using the same ERP-based power loop (see figure 5) – while there are little changes to the development of the systems or the expertise within the company, there is no longer need for the finance function if the automated accounting system is developed and set up correctly and hence the control over the systems now stays within the IT department.

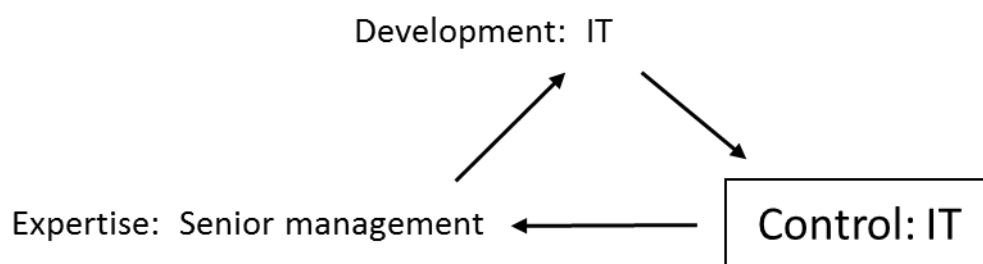


Figure 5: power loop schema

We could still see some data analysis within the finance function but the importance of having a separated finance function would slowly perish. However, even with a developed AI, there are problems associated with dissolving a department. We add on the article by Payne (2014), who was concerned about automation making the processes less transparent and harder to fix in the event of an error, by broadening the problem due to the complete digitalization of the function, which then becomes even more apparent if there was no finance function to come back to. Except for TellCo that is currently implementing robotics into its systems, all of the companies expressed a distrust in completely digital finance functions and focused on a challenging task to avoid having a flaw in their underlying processes.

Moreover, this model together with the current situation in the companies is in line with articles by Arnaboldi et. al. (2017) and Bhimani and Willcocks (2014) that discuss the slow speed of the transformation of accounting information but end up concluding that a revolution is coming to a way companies operate and that the new technologies will accelerate the rate of change. We argue

that while the digitalization for the front-end of the companies is a continuous development where the companies are trying to meet customers' demands, the digitalization of the finance functions essentially follows a step function development – making no changes until there is a technology completely ready to be implemented. The empirics have shown that for this pattern of behaviour the most important reasons were poor return on investment together with small margins of the companies, conservative culture of the finance function, and the riskiness related to the issue of stability. The opinion of big things to happen in the finance function is shared by TellCo and most of the IT people in the other companies and because of this “step function behaviour”, the sudden implementation of new technology would make the loss of control imminent for the finance function if it remained in its current form.

5.1.2 Digitalization-based power loop model

Should we instead include the notion of hybridisation, the discussion becomes somewhat different. Hybridisation in the context of accounting shares many characteristics of the business advisor role in the sense that both are illustrating how the role incorporates a wider area of knowledge. Given that the companies are able to successfully adjust to and adopt the digitalization we will expect to see that this process is expanded further so that finance activities no longer are tied to its specific function but rather exist in every aspect of the business; everything will be easily accessible and easy to use and understand, there will be no need for manual inputs, and results and analyses will be easy to turn into concrete actions. The accountants have been in process of evolving to become more of a business advisor, but there was always an issue of dealing with the tension of centralization and decentralization of the finance function (Granlund and Lukka, 1997; Busco et. al., 2008). There will always be the need to report financial results to external stakeholders and there will always be a need for internal users such as sales department and IT department to know how the business is developing. Hybridisation treats the accounting as a craft and not a profession, and thus allows for the knowledge to be transferred to other organizational groups and thereby allowing the organization to manage these tensions.

Using the theoretical framework, we argue that after a complete digitalization of the finance function, the control will not be taken away from the finance function, rather there will be a hybrid of the finance function and the IT department. The basic accounting tasks together with the disclosures such as quarterly or annual reports will become completely automatized and replaced by machines. This hybridized department can already be seen in the modern start-up companies

which operate without the burden of having a legacy system. It looks for value in the data, provides them with context, there is more combined knowledge on IT investments and how those affect the financials and KPIs, and it helps with some strategic decision-making since the department works directly with the real-time data. This reflects the notions of how different professions adjust to one and other (Kurunmäki, 1999).

The trend we have experienced regarding the business advisor role of the accountant and the decentring of the finance function is the process of getting towards the goal of becoming truly hybridised. In the hybridised state, there will no longer be the need to have a staffed finance function. Instead, finance people can blend with the rest of the organization and the systems can maintain the bookkeeping and other finance oriented tasks that require manual input. By treating the accounting as a craft rather than a profession we can envision how the previous unstable strategic alliances gets replaced by the ever-important IT department and finance people in a hybridised form (see figure 6 below). This new hybrid department brings the important knowledge together, helps with strategic decisions, and connects the data with specific information, while still maintaining the automated accounting systems. We argue that this is the new form of the finance function and this is the state where all the companies should be heading. This way the finance function will retain its value in the companies because it will not lose the departmental battle over control of technology. We observe the emergence of this hybridised department in modern start-up companies that are not encumbered by a legacy system and a conservative management.

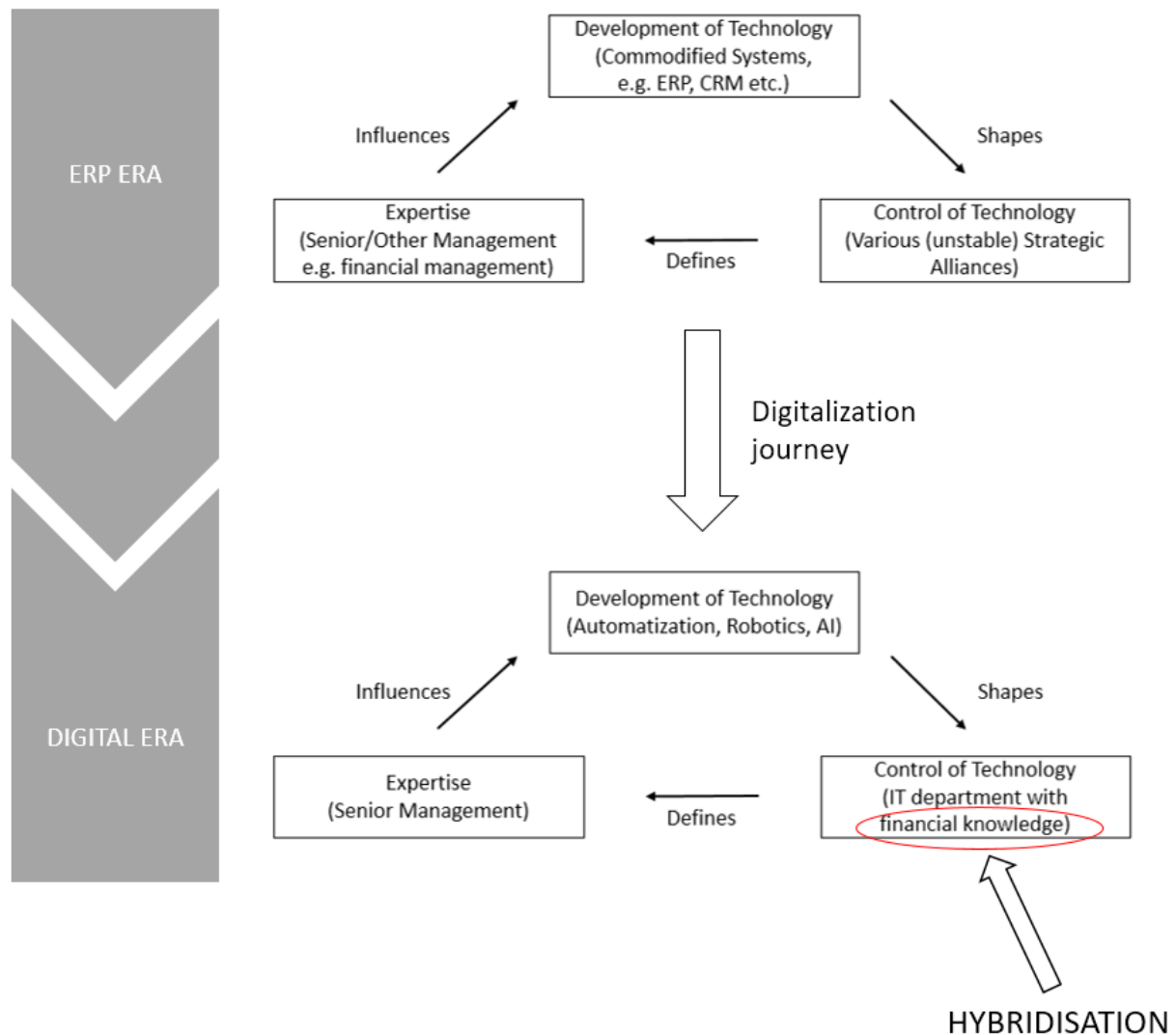


Figure 6 – the change of the finance function due to digitalization

According to Vasarhelyi, Kogan, and Tuttle (2015) digitalization differs from the previous innovations in the way it offers automation of information collection and how it opens up for analyses on a more diverse set of data, which is in line with our suggested new form of the hybridised finance function. Digitalization enables hybridisation. It allows the finance function to use its business advisory context properly and it helps with contextualizing the data and making better analyses. This article does not necessarily talk about the disappearance of the finance function but merely suggests the way how the finance function should change. The article uses an analysis of customer's click path on websites as an example of deeper analyses and how the information can be used to provide better insight into customer behaviour. Before the digitalization, this task would fall unto the marketing or the sales department, however we are already seeing this behaviour in AirCo and HotelCo that also have a much better access to real-

time data and can make better use of it within their accounting systems, e.g. getting better market and revenue predictions or allocating costs more correctly to the concrete expense.

We add on the article by Payne (2004) where he argued that even if the analysis of big data does not fall under the finance function, there will still be a need to put a value on the collected data, and for the accountants to remain relevant, they would have to analyse relevant information while taking on big data. We observed this behaviour in HotelCo with their new accounting tool, however we now argue that this analysis does fall under the finance function, it is just its new direction that it will be taking after a complete digitalization of the finance function. The knowledge and the competencies to analyse and understand the data will be in the new hybrid department where it will be even easier for the accountants to access the data when they deem necessary.

Last, but not least we discuss the article by Srivastava (2014) and provide some empirical data for the argument that because of the changes in business activities, such as more investments in innovation, IT, and other intangible capital, the intangible nature of the new investments prevents recognition in the financial statements and therefore valuations of the companies call for more analysis of the information affecting these value drivers. Again, we observe more thorough cooperation of the IT and the finance function. AirCo demands their accountants to understand the IT investments in order to better see the value, how it will affect the financials, and which investment to go for. BookCo has an issue with the change of the contracts with their suppliers. The accountants need to understand the digital product and the new forms of data they recently started to collect and because of that they are much more interlinked with the IT department of BookCo. They also have not set up their KPIs yet and are having difficulties with benchmarking and the valuations of potential acquisitions. The accountants at BookCo are simply accustomed to working with their physical books and are not knowledgeable enough to make changes to their accounting practices without involvement of the IT department. In contrast with that are HotelCo and TellCo that have started to digitalize their finance functions and this form of hybridisation has already been set up among these companies.

5.2 The digitalization journey

As established in the previous section, the digitalization progress in the four companies varied. AirCo is the company that shows most characteristics of the ERP-based power loop. On the other side of the spectrum we find TellCo which is the company that has shown the most progress in

digitalising the finance function. In the opening quote, the CIO of TellCo gives us a clear picture of how the company understands the impact new and upcoming technologies will have on the finance function. However, even in TellCo's case the finance function is very far away from being completely digitalized. Only recently they improved their budgeting from annual to more frequent even with the data readily at hand, they still keep the accounting practices either very basic or there are processes that are connected together with one slowing the other down. Such is the case of their bookkeeping, when closing the books can be done the same day requested but forecast planning based on those numbers take a very long time. These contrasts only hurt the finance function because it is only seen by its worst parts without acknowledging the advancements it has made in the past years.

For BookCo and AirCo, the situation is even worse. They both have very obsolete processes, AirCo's legacy system was built during the pre-internet era and some of the relationships and contracts rely on this system, and BookCo has had established ways of working for a very long period since there were almost no changes in the book publishing industry. On top of that, AirCo's operations revolve around providing air travel services for travelling passengers and freight. There is very little room for digitalization of their services. HotelCo is somewhere in the middle between TellCo and BookCo together with AirCo. They have vastly improved their forecast planning with a tool that can access real-time financial data of the company, they automated some of the processes, but the level of digitalization of the finance function is still very basic. Using the theoretical framework, we highlighted the position of the companies in question. This model only shows the digitalization of the finance function, not the digitalization of the company per se. The digitalization era involves having a hybridised finance function with IT department which requires a digitalized and automated accounting.

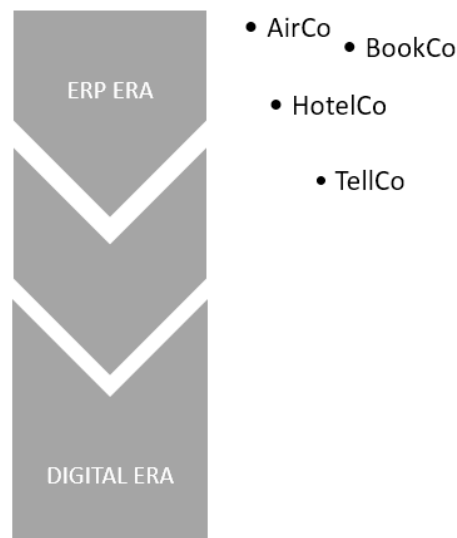


Figure 7: Level of digitalization of the finance function

Similarities can be seen in the ERP-adoption era, where the companies only changed their finance function very slightly as discussed by Granlund and Malmi (2002). Globalization impacted the companies that needed to consolidate their financials and centralize their asset management in order to compete internationally and therefore the call for changing the accounting was driven by the need of the companies. Compared to modern day digitalization, where the changes are essentially product and market driven, we could expect smaller changes to the back-end of the companies. However even then, the pace of adapting newer technologies to accounting is similar. But since the environment has changed, the explanation for these minor effects has to be sought elsewhere.

While all the companies are aware of the benefits of digitalizing the finance function, little has been changed. There are several reasons and explanations for this phenomena. Besides poor return on investment, having legacy systems, conservative culture, and the issue of stability where the companies see the finance function as an anchor in an unstable environment, as discussed by Granlund and Malmi (2002), one of the reasons why we do not even see that much hybridisation is that the demands on the finance function are changing. More decentralization is required when the responsibilities of the accountants stretch further and when the expectation is that they ought to have more operational knowledge. Busco et. al. (2008) provides insight into tackling this problem of being both centralized and decentralized by having a performance measurement system and finding ways of managing the accountants in a constructive manner. However, in our case we see that measuring the progress of digitalization is very troublesome for the companies. The finance function does not know how to handle this problem and except for TellCo, the companies are

struggling to find good KPIs. This issue goes hand in hand with the hybridisation. If the companies hybridise the finance function with the IT department, we will see more knowledgeable accountants who will have a better idea of digitalization progress measurement. However, at the same time it is challenging for the companies to hybridise the departments when they are not digitalizing the finance function also because of the poor ability to track the progress. Nevertheless the companies, especially AirCo and HotelCo, believe that establishing the targets is just a matter of time when the pace of changes in the industry slows down.

Contrary to previous literature, the companies show that there is no significant decrease in the number of accountants. Anastas (1997) and Newman & Westrup (2005) talk about different causes for the diminishing number of accountants and while it may have been true during the implementation of an ERP system, this trend has either completely stopped or is now turning around. AirCo talked about the outsourcing of IT and finance and deemed it a bad decision. They are now insourcing it back into the company to bring back the knowledge, which is in line with the above mentioned hybridisation. While BookCo is very old fashioned and conservative, having accountants who were not very comfortable with the digital changes coming to their market, both TellCo and HotelCo agreed that they will not be reducing the number of the finance people and that in fact they are even more required due to the increase in their competencies, such as contextualizing the data or making analyses “from real-time data”.

Furthermore Quattrone and Hopper (2005) showed on two case studies how the implementation of ERP systems affected the organizations, namely the control over the systems, and while the digitalization in the case companies have not gone sufficiently far enough to make reliable conclusions, we do not see any differences in how these established companies prepare for the departmental battle and hybridisation. Using our model and consulting our findings with articles by Grover and Ramanlal (2004) or Lev and Zarowin (1996), we believe that the digitalization of the finance function will fundamentally follow the same pattern for all the companies. We base that argument on how the data analysis has been developing and what roles and responsibilities can the finance function take on in the future. Digitalization is seen as the movement towards automated systems which have the potential to replace manual labour while improving the accuracy of data and minimizing the risk of data flaws.

Digitalization is enabling hybridisation and we see hybridisation as a way forward for the finance function. When the accounting is treated as a craft, it is no longer necessary to have a separate

finance function, instead it is much better for the companies to combine the knowledge of the IT department and the finance function, in which case the control will remain within the new hybrid department while also enabling the finance people to bring in more value than just doing a manual bean counting. However, even with all the benefits, in general none of the companies digitalized their finance functions. We observed some forms of hybridisation in the companies, such as strategic CFO at BookCo or advisory of IT investments at AirCo, but because of several reasons including economics of things or very limited knowledge of how to track the digitalization itself, all of the companies are still at the beginning of the journey.

6. Conclusion

This paper contributes to the existing research by inspecting the current position of the finance function in four established companies operating in different industries. We answer the call by articles talking about upcoming changes to the finance function (Arnaboldi et. al., 2017; Bhimani and Willcocks, 2014) and provide empirical data in an attempt to answer the proposed questions. We look at the journey of digitalization in the companies and study how it affects both their front-end and back-end. We extend the concept of modified ERP-era power loop (Newman and Westrup, 2005) and recognize the changes caused by the digitalization journey. We believe that the digitalization is enabling hybridisation, which directly influences and shapes the departmental battles by creating a hybrid IT and finance department. This is recognized as the final form of the completely digitalized company where the four inspected companies should be heading. We analyse the data by looking through the lens of the model, which begins with the Newman and Westrup ERP-era power loop and ends with our proposed digitalized-era power loop. While there are substantial differences in terms of how much digitalized the finance function of the companies is, most notably between AirCo and TellCo with the latter having the most digitalized finance function, we still come to the conclusion that the companies have not come far enough in their digitalization journey. This is explained by three main reasons: poor return on investment due to small margins and problems with legacy systems, conservative culture, and the riskiness related to the issue of stability. In addition to that, digitalization affects the front-end differently than the back-end. Digitalization of the front-end is a continuous development where the customers demand new services and flexible solutions when they appear on the market, however for the back-end, in particular the finance function, the digitalization is not a process but rather a step function – once the digitalization reaches the final point, the finance function will entirely change. But in the anticipation of new technologies, we conclude that the run-way for getting the finance function to a hybridised state is getting shorter and shorter. Should the companies avoid preparing the finance people in making them more acquainted with various departments, e.g. the IT department, the construction and design of the new systems would reside with the IT department with limited influence from finance people.

Based on the cases, instead of seeing the battle between the departments (specifically IT and finance) as a selfish enactment where each party wrestle for control for themselves, we propose that digitalization can bring a sense of unity where finance knowledge is treated like a craft, ready to be shared and taught to others. Digitalization is making sure that the craft can more easily be

transferred and not staying restricted to a specific department. The hybridisation of professions is the mediating factor that has to a certain degree started a movement within organizations. There are already signs pointing to the realization of the need to work cross border and that the accountants need IT skills and vice versa.

Overall, this study supports the notion of the finance function being a “late bloomer”, i.e. very reluctant to any change, when the same behaviour was observed during the ERP implementation era (Granlund and Malmi, 2002). However, when the technology replacing the manual accounting jobs is readily available for implementation, the finance function as we know will disappear, yes, but we need to realise that the next generation of finance is on the rise. We are approaching the verge where 20 years of accumulated research in the field of the role of accountants and their position is finally coming to realization.

7. Limitations and Future Research

We are aware that there are some limitations when it comes to the contributions of this study. Findings from qualitative and interview based studies are hard to generalize. What we find might not correspond to what other studies find in other settings. But at the outset of this study we did not aim to make such claims, we did not expect to find a clear answer to where the finance function is positioned within the organization in the context of digitalization.

First, being an exploratory multiple case study, this paper has its shortcomings by nature. The purpose of the study has been to create a basis for continued research within digitalization and the finance function. We map the current landscape to see where in the process of digitalizing the finance function the selected companies are. While we find interesting tensions within the organizations, these tentative conclusions have to be further developed. For example, the depth in the cases are limited compared to what would be found in a single case study. Consequently, explanations of phenomenon occurring in the case companies could be elaborated in a more nuanced manner if a single case study approach would be used. In addition, now that we have an understanding of the current state in four companies when it comes to the digitalization of the finance function, we believe that it would be interesting to conduct a study which goes into more depth on hybridisation and how this affects the relationship between IT and finance. We would encourage further research that elaborates on the issue of why the IT function might get more control compare to the finance function and in what instances that occurs. In this study, we see indications of front end driven changes where the product or service are explaining why the finance function in some cases experience minor changes compared to other.

Furthermore, younger companies that does not share the same heritage as the case companies have not been considered in this study. This presents itself both as a limitation and a suggestion for future research. In the selection of companies, we are purposely not including any start-ups nor companies founded during the digitalization era. This let us focus on the traditional companies that have established processes and ways of working within the finance function and it enabled us to investigate how digitalization is tackled and in what way it is adopted. However, it would of course be of interest to conduct a similar study based on young companies - perhaps on companies that are trying to meet the demands of an already digital customer. How are these companies structured and how does the finance function provide value differently compared to traditional companies? And given that these younger companies are already working with a hybridised finance and IT

department, does it prove to bring more value than a classic setup of the case companies? An interesting aspect that digitalization brings is that there are different levels of digitalization, as we note, we see automatization as the lowest tier of digitalization and robotics as the mid-tier and finally artificial intelligence as the last instance of digitalization. It would be interesting to see how each tier is affecting the role of the finance function in more detail. Where does the control of the technology end up? The complexity increases when going to a new stage and what does that mean for the finance function. Are they able to keep up and remain in control or will we actually come to the point where the finance function eventually disappears?

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Appendix 1: Example of Interview Guideline

General questions

- Tell us about your background and responsibilities
- How do you perceive digitalization in your company? And how much have you been involved?
- How much has your department been digitalized?
- Has the digitalization affected you in any way?
 - If it did – did you have to adjust your working behaviour to it?
- Have you proposed or have you been involved in some digitalization process?
- Does the digitalization affect the accounting/financial systems in any way?
- Does the digitalization threaten any jobs or people at your company?
- Specific industry issues? – e.g. sensitivity issues in the airline industry
- How do you measure progress of digitalization?
- Did the digitalization affect performance measurement and budgeting in any way?

Questions to IT

- Do you face any resistance in the organization when it comes to IT related topics?
- What is the current biggest issue with IT and technology in your company?
- What would make your job easier?
- How much of the finance function is now digitalized and is it enough?
- Where do you see the future of the finance function?

Questions to Business Controllers/Developers

- Where is the involvement more necessary – IT/development/finance?
- What do you prioritize the most in terms of digitalization – finance side/automatization/..?
- What is the most common dialogue you have with CFO?
- Compared to previous working experience, how difficult is it here to make some changes (cultural mindset)?
- How difficult is it for you to work with legacy system in an old company?