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Reaching for the Cloud(s)

An exploratory case study on the changes to the role of management accountants following the introduction of a cloud-based ERP system

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Abstract

This thesis explores the changes to the role of management accountants in a large public organization following the implementation of a cloud-based ERP system. The technology power loop by Newman and Westrup (2005) was further developed by incorporating literature on cloud technology and applied as a tool for analyzing the impact of cloud-based ERP systems on the role of management accountants. We contribute to existing literature by showing that the prominent view of management accountants as a homogenous group is ignoring the possibility of incongruent role developments within organizations. This heterogenous role development is argued to emanate from both the willingness of management accountants to expand their role and the limited upfront customization and outsourcing that cloud technology entails. Furthermore, we argue that the dominant notion of management accountants transforming from "bean counters" to "business partners" is too naïve and this transition can be reversed in a cloud-based environment. This also adds to the discussion on the binary view of management accountants since a more nuanced typology was found. Moreover, we found that a new form of hybridization emerged, which we label de-hybridization, resulting from the system no longer being stored in-house.

Keywords: Role of Management Accountants, Cloud, ERP, SaaS, Technology Power Loop

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1. Introduction

> We live in an outsourced environment with the service provider [of the cloud system], so we don't do much ourselves, a lot of it is done outside (Senior management accountant, SOE_1)

The above quote highlights a recent trend among organizations. Cloud based IT systems have increased in popularity due to their promise of increased flexibility and lower cost of deployment. The technology entails that a large part of an organizations' IT infrastructure is outsourced to a vendor or service provider, introducing new work processes and structural idiosyncrasies. This study explores the changes to the role of management accountants [MAs] following the implementation of an enterprise resource planning [ERP] system that incorporates this cloud technology.

The last two decades have witnessed a re-evaluation of what the role of the MA entails. The traditional role of routine financial reporting that dominated much of the late 20th century, personified in terms such as "bean counter" or "number cruncher", has shifted to include a broader responsibility of advising managers and producing more forward-looking business information (Evans et al. 1996, Granlund, Lukka 1997, 1998, Malmi 2001, Yazdifar, Tsamenyi 2005, Windeck et al. 2015). This "business partner" role, as it is commonly referred to, is supposed to act in consultancy capacity and seek to interact and intervene in a more value-adding manner compared to the traditional role. The reasons for this transition have been studied in various settings and the overarching sentiment from extant research is that the bean counter role is behind us.

Much literature on the changes to the role of MAs have focused on large scale ERP systems. These were on-premise, meaning the data and applications are locally hosted (Grabski, Leech & Schmidt 2011), and the general observation was that they act as an enabling factor for the introduction of a business-oriented role (see e.g. Caglio 2003, Newman, Westrup 2005, Scapens, Jazayeri 2003). Even though on-premise ERP systems are still in use today, they are now starting to disappear from the vendor offering. Their successors are cloud-based, delivered as Software-as-a-Service [SaaS], and promise a more flexible IT infrastructure where system development and IT management is outsourced. These systems (which we label cloud-based ERP [CERP] systems) should produce different effects on the role of MAs as it introduces automatic upgrades, improves accessibility to information and moves the system from the enterprise to the vendor.

A consequence from adopting a CERP system is outsourcing a large part of your IT infrastructure. This entails accepting a more standardized solution (as upfront customization is limited) and letting go over some control of development and company data. Standardization and automatization have been argued to prompt more analytical work for the MA as less time is spent on routine tasks and processes can be optimized. By outsourcing to a higher degree, the need for internal IT expertise is reduced and external parties (i.e. vendor and service provider) play a larger role provided with increased power and responsibilities. The cloud features of a CERP system have the potential to impact the internal dynamics of organizations and hence impact the role of MAs.

Although previous studies show profound effects on the role of MAs following the introduction of a traditional on-premise ERP system, as digitalization sweeps society these studies move towards redundancy and it is imperative from a theoretical standpoint to shed a modern light onto the development of the role of MAs in a cloud environment. In other words, there are no studies that explore how a CERP system and its inherent characteristics, such as outsourcing and limited upfront customization, impacts and changes the role of MAs in organizations**.** This leads us to our research question:

"What are the changes to the role of management accountants following the implementation of a cloud-based ERP system?"

In order to answer the above research question, an exploratory case study was conducted in a large public organization [PubliCo] that had just completed a CERP system implementation. An integrated framework was established in order to investigate the role of MAs in this setting. This framework is based on Newman and Westrups' (2005) technology power loop that explores how ERP systems are made to work, or consumed, by studying the recursive relationships among development of technology, control of technology and expertise. The framework was further developed by introducing cloud technology through concepts such as SaaS and cloud computing that is inherent to the CERP system. More specifically, these concepts in combination with the technology power loop were used to study the effects of a CERP system and how it produced changes to the role of MAs.

This study is intended for a larger audience interested in the development of the role of MAs in a CERP environment and contributes to existing literature on the MAs' role in an ERP setting by incorporating cloud technology. First, it sheds light onto the effects that CERP systems have on the role of MAs. This is important from an academic perspective as much of previous literature concerns structurally different system-implementations. Secondly, most researchers

have assumed MAs to be a homogenous group in organizations. Our findings suggest the possibility of a *heterogenous* role development among MAs depending on the spatial location (organizational level) of the accounting function. We argue that this was driven by a combination of the willingness of MAs to expand their role and the increased level of standardization and outsourcing that cloud technology entails.

Adding to the findings of El-Sayed and El-Aziz Youssef (2015) and Mack and Goretzki (2017), we suggest that the binary assumption of MAs as either bean counters or business partners is too simplistic and argue for a more nuanced typology where the role is situational and materializes in different ways depending on both contextual and technical factors. Moreover, our findings indicate that the prominent view of MAs transitioning from bean counters to business partners is not as unidirectional as previously assumed. Supporting Hyvönen et al. (2015), our findings indicate that a *reversion* back to the bean counter role is possible.

Furthermore, by building upon the discussion on hybridization in previous literature (see e.g. Burns, Baldvinsdottir 2005, Byrne, Pierce 2007, Caglio 2003, Hyvönen et al. 2009, Newman, Westrup 2005), we argue for a new form of hybridization, what we label *de-hybridization,* resulting from the system being outsourced and that IT interaction was no longer needed (to the same extent) at local accounting functions. Lastly, this thesis adds to the literature on the technology power loop, arguing that development and control of technology is shared among internal and external stakeholders in a cloud-based environment.

The remainder of this paper is structured as follows. The theoretical literature is presented in chapter two, which includes the theoretical perspective and framework. The research methodology is described in chapter three followed by our empirical findings in chapter four. The findings are discussed in chapter five and conclusions and contributions are presented in chapter six. Finally, limitations, practical implications and suggestions for future research is presented in chapter seven.

2. Literature review

The theoretical base for this study is outlined in the following sections. In 2.1. the development of the role of management accountants [MAs] in an ERP setting is presented. In 2.2. the theoretical concepts of cloud computing and Software-as-a-Service [SaaS] are described followed by comparison between traditional ERP systems and cloud-based ERP [CERP] systems. Finally, the literature in section 2.1. and 2.2. is integrated into a framework in section 2.3.

2.1. The role of management accountants in an ERP setting

2.1.1. Background

MAs have long been known to embrace multiple tasks. Simons et al. (1954) defined them as attention directing, record keeping and problem solving. The first two adhere more to compliance and control-type issues while problem solving provides business managers with information used for decision making (Emsley 2005, Friedman, Lyne 1997). This rather standardized and static view of accounting, providing temporary reports and aggregated analysis, depicts the traditional picture of number crunchers having no particular influence over business or strategy. Lukka (1998, p. 333) describes the classical view of accounting as 'it has to be there, but it cannot contribute much to current problems of running organizations, let alone the capacity to intervene in more strategic issues'.

The traditional role for MAs was to produce routine financial analysis, reports and information, espousing a role seen as of little use for business decisions and strategy formulation. This bean counter role, as it is commonly labeled in literature (Burns, Baldvinsdottir 2005, Byrne, Pierce 2007, Friedman, Lyne 1997, Granlund, Lukka 1997, 1998, Järvenpää 2007, Windeck et al. 2015, Yazdifar, Tsamenyi 2005), was rudimentary as it was only a provider of information with the narrow responsibility of producing accounting information about the past in a timely manner. Characterized by manual work and being perceived as a "hygiene-factor" for organizations (Lukka 1998), traditional MAs fell short of actually providing managers with any tangible, value-adding business interaction.

2.1.2. Towards the business partner

With time, this perception and meaning of accounting began to fade and its significance and utilization increased for most organizations. Academic literature speaks of a move towards a more business-oriented role; a divergence from the traditional control-type to more business analysis and organizational consultancy (Evans et al. 1996, Granlund, Lukka 1997, 1998,

Windeck et al. 2015, Yazdifar, Tsamenyi 2005). Contrary to the bean counter role, this business partner role is fluid, connected to other parts of the organization and seeks to interact and intervene in a more strategic and forward-looking manner (Järvenpää 2007, Lukka 1998). Accounting information suddenly becomes an integral cog in the organizational machinery and acts in advisory capacity that is essential for managers and strategy.

The reasons for this transformation have been studied extensively and several contingencies have been identified. Friedman and Lyne (1997) found that as a consequence from implementing a new management accounting technique (Activity-Based Costing) the bean counter image significantly improved. This could be understood from the notion of integration and co-operation as both can be seen as facilitators for change. Byrne and Pierce (2007) found that management and the MAs themselves play a critical part in the shaping of their role, hence raising the question if the business partner role should best be studied at a micro- rather than macro-level. Other catalysts such as organizational restructuring and decentralization (Järvenpää 2007), the co-operation and positioning of MAs in proximity to managers (Burns, Baldvinsdottir 2005), top-management support (Goretzki et al. 2013) and societal changes such as internationalization and globalization (Granlund, Lukka 1997, 1998) have also been argued to push MAs into a more business-oriented role.

Integration, increased business complexity and organizational restructuring seems to be common themes in the MA role literature. Organizations have over the past decades turned to ERP systems to cope with the uncertainties of a changing environment. ERP systems were designed to solve the problem of fragmented information streams by standardizing both data gathering and internal processes between modules (Davenport 1998). Maintaining a myriad of different computer systems and the related storing, transforming and collecting of data from one system to another is both expensive and time-consuming. Davenport is regarded as a pioneer on enterprise systems research and one of the first to introduce the complexities of ERP implementation and integration. He poetically notes that ERP systems 'appear to be a dream come true...It is certainly true that enterprise systems can deliver great rewards, but the risks they carry are equally great' (Davenport 1998, p. 121f.). Indeed, ERP systems presents not only opportunities but also challenges due to its' inherent complexities. The organizational fit is usually seen as a key factor in explaining the success or failure of its implementation (Hong, Kim 2002) and there are numerous examples where the implementation of an ERP system fails, leaving the enterprise to suffer operational and financial damage.

Embedded in these systems is the promise of integration through standardization of operational processes and enforcement of their centralized management. They exude a utopian potential of solving management problems, molding the organization to a desired form and achieving higher levels of performance (Teittinen et al. 2013). Although there is a disagreement over the effects of ERP systems on management accounting in general, the effects on the role of MAs are commonly argued to be profound (Grabski et al. 2011).

Scapens and Jazayeri (2003) found fundamental changes in the nature of management accounting information used following an ERP implementation. In particular, the authors found that the enterprise system eliminated routine jobs, provided line managers with accounting knowledge, produced more forward-looking information and expanded the role of the MA. It is not surprising that enterprise systems have the ability to create a business role for the MA. The characteristics of integration, information consolidation and co-operation lead to business involvement, leaving accountants with a more interpretive and strategic controller role (Quattrone 2016).

It is evident that the prominent perception for the role of MAs is a transitioning from bean counters to business partners and empirical evidence suggesting otherwise is limited. However, Hyvönen et al. (2015) argue that in an ERP environment the transformation can be reversed. As accounting information becomes more dispersed within the organization following the adoption of the ERP system, they witness the introduction of a sale controller that emerged as partner; a role combining both accounting and managerial tasks. Consequently, this marginalized the existent local controllers and increased their focus on financial reporting and accounting data.

When reviewing the above literature, we found some discrepancies in the labels used for describing the role of MAs. Synonyms such as “business consultant”, “management-oriented”, “service-oriented” and “internal advisor” were used to describe the business partner role, and synonyms such as “number cruncher” and “watchdog” were used to describe the bean counter role. In addition, the definition of what the roles entail differs slightly among articles. Table 1 provides the role characteristics we identified based on our combined understanding of the revised literature. For clarification, this study adheres to the labels of bean counter and business partner.

Role characteristics	
Bean counter	**Business partner**
Compliance focus	Business focus
Provider of information	Provider and user of information
Financial reporting	Business analysis
Focus on accounting information	Focus on both accounting & non-acc. information
Financial knowledge	Strategic understanding
Backward-looking	Forward-looking
Record keeping	Involved in business decisions

Table 1: Role characteristics of bean counter and business partner. Authors' creation.

2.1.3. Questioning the binarity of roles

A limitation of previous literature is the binary view of bean counters and business partners. A recent stream of literature presents a wider view of the role of MAs, arguing that the classical stereotypes are too simplistic (El-Sayed, El-Aziz Youssef 2015, Lambert, Sponem 2012, Mack, Goretzki 2017, Nilsson et al. 2011). Paulsson (2012 p. 391) criticizes the classic typography by asserting 'it is difficult to find one single label like bean counter or business partner that fits the role of the management accountant'.

Building on the findings of Olve (1988), Nilsson et al. (2011) provides a more nuanced view and defines four different roles: the accountant, the analyst, the educator and the coach (ibid, p. 249). In a similar study of 10 different multinational organizations, Lambert and Sponem (2012) found four different styles - discrete, safeguarding, partner and omnipotent - that the MA function adopted depending on the degree of authority of the MAs and whether they impacted local or central decision-making. It thus seems as if a more comprehensive view and broader spectrum of the role of the MA is at least conceptually possible.

Another stream of research suggests that the idea of bean counters and business partners is too static, arguing for fluidity and that the distinction between the two is smaller than previously suggested. El-Sayed and El-Aziz Youssef (2015) found that the role of MAs adjusts to different configurations of technologies, artefacts, entities and spatial settings. They label these configurations "modes of mediation" and conclude that the role of MAs changes to fit the current setting. Mack and Goretzki (2017) suggests that MAs are in an in-between position; at times acting more as bean counters while at other times behaving more like business partners rather than belonging to either of the stereotypes. These studies increase our understanding of the complexities related to the role of MAs and gives us a welcoming addition to the traditional binary view of MAs being either bean counters or business partners.

2.1.4. Towards hybridization

A phenomenon labeled hybridization emerged within the literature on the role of MAs and refers to some form of interconnectivity between accounting and other business departments. Two distinct literary directions can be identified; one focused on hybridization of MAs and one where non-accountants make greater use of accounting information. The first is described as a process where accounting professionals broaden their expertise into non-accounting fields (Burns, Baldvinsdottir 2005, Byrne, Pierce 2007, Caglio 2003, Newman, Westrup 2005). This has especially been witnessed with the introduction of ERP systems seeing they visualize, consolidate and produce company-wide information faster and more efficient. These systems have the inherent potential to free up time and resources in the accounting department, creating an opportunity for MAs to get more involved in strategic issues and in the design and management of the organizational control systems (Caglio 2003, Granlund, Malmi 2002, Scapens, Jazayeri 2003).

The second type of hybridization points towards the decentering and diffusion of accounting expertise (Hyvönen et al. 2009, Kurunmäki 2004, Newman, Westrup 2005, Scapens, Jazayeri 2003). Hybridization is here described as a process where people outside the accounting department start using accounting information and themselves effectively adopting a hybrid role. For example, Kurunmäki (2004) studied the hybridization of accounting in the medical profession in 1990s following the New Public Management reforms in Finland. She found that medical staff became more committed to accounting issues, adopting pricing and costing practices, as a consequence of increased external pressure on resource planning.

When looking at ERP systems in particular, studies have witnessed that much of the traditional accounting work moves out to the business units themselves, reducing the need for accountants' involvement and hence pose a significant threat to MAs becoming marginalized (Newman, Westrup 2005, Scapens, Jazayeri 2003). This, in combination with the increased accessibility of accounting information associated with ERP systems, leads to disbursed actor involvement where creation, usage and analysis of accounting information is no longer isolated to the accounting function. This second type of hybridization has been witnessed in the IT profession (Newman, Westrup 2005), among military personnel (Hyvönen et al. 2009) and other non-accountants (Caglio 2003, Scapens, Jazayeri 2003). In an attempt to reconcile the two views on hybridization, Caglio (2003) poses the following questions:

> Are accountants likely to broaden their roles and expertise in the field of business and IT? Or, instead, is it line people and IS [information system]

> professionals who are going to expand their activities and competencies in the traditional preserve of accountants? (p. 124)

As a possible explanation, Abbott (1988) argued that the willingness and ability of different professional groups to expand the grounds to which their operational expertise adhered were instrumental factors for the direction of hybridization. Similarly, Granlund (2011) suggests that although previous studies point at two types of hybridization, the only certainty is that the domain of accounting is changing as a result of hybridization. It therefore seems like the process of hybridization is situational and findings cannot be generalizable nor predicated a priori. This duality is illustrated by Newman and Westrup (2005), which emphasize the capability of accounting department to remain in control as an essential factor. If control is not retained MAs risk marginalization and other professionals, mainly within IT, take on the hybrid role.

The disagreement among researchers on hybridization is evident, but perhaps not surprising. Prevailing structures, practices, hierarchies and expertise can all impact the level of hybridization among an organization's MAs. Seeing that hybridization can materialize in different ways, due to both technical and social drivers, directly and indirectly linked to new technologies, a question of co-existence emerges. Hybridization should perhaps not be seen as either or, but rather both and, meaning the different views on hybridization are not mutually exclusive but can in fact co-exist in larger organizations. In addition, hybridization that stems from the introduction of an ERP system usually concerns the interaction with different groups, particularly accounting and IT, and the level of expertise and control that each group holds determines the level of hybridization. Contemporary ERP systems can be delivered via the cloud, where IT and development are outsourced, and a question arises if this arrangement has the potential to impact how hybridization materialize within an organization.

2.1.5. Concluding remarks on previous literature

The role of MAs has been researched in multiple settings over the past few decades. The general consensus is that the role of MAs as being bean counters is behind us and we are seeing a trend towards the more strategic business partner. In contrast to the bean counter role, a producer of static information, the business partner role seeks to provide strategic advice for management and intervene in a more forward-looking manner (Järvenpää 2007, Lukka 1998). Furthermore, studies have argued for the potential of hybridization when company-wide IT systems are introduced. It is seen as a two-edged blade that either can lead to a marginalization of the role of MAs, as other groups start to perform traditional accounting tasks (Hyvönen et al. 2009,

Kurunmäki 2004, Scapens, Jazayeri 2003), or as MAs expanding their operational domain (Burns, Baldvinsdottir 2005, Byrne, Pierce 2007).

Traditional ERP systems have been witnessed as an enabling factor for the introduction of the business-oriented role (see e.g. Newman, Westrup 2005, Scapens, Jazayeri 2003) as they have the inherent capacity to consolidate and optimize information flows from all ends of the organization. In their literature review of previous ERP research in accounting, Grabski et al. (2011) concluded that the role of the MAs in an ERP environment is evolving into a business partner. However, some recent literature questions the notion of the role of MAs transforming from bean counter to business partner. Although not the main focus of their study, Hyvönen et al. (2015) finds evidence suggesting that the transition might not be as unidirectional as previously assumed. In addition, while the typography of two distinct roles dominate prior literature, some researchers argue that the line between the two is more fluid and MAs can shift back and forth between the two (El-Sayed, El-Aziz Youssef 2015, Mack, Goretzki 2017).

Even though previous studies provide valuable contributions to our understanding of the role of MAs and its transitional nature following both external and internal catalysts, no research exists that study its development in a cloud-based IT environment. Traditional ERP systems have been witnessed as an enabling factor for the introduction of the business-oriented role. However, these systems were on-premise, meaning the data and application are locally hosted, and as digitalization sweeps society the studies of their effects move towards redundancy. Their successors are cloud-based, available as Software-as-a-Service, and promise a more flexible IT infrastructure where development and system management are outsourced. These features have the potential to impact the internal dynamics of the organization and hence the role of MAs. The role of MAs in this setting is an unexplored area that deserves attention and Grabski et al. (2011) highlights the need for further research into the effects of cloud technology on organizations.

Although previous studies show profound effects on the role of MAs following the implementing of a traditional ERP systems, the effects of cloud-based ERP systems are still unknown. It is thus imperative from a theoretical standpoint to shed light onto the development of the MA role in this setting.

2.2. Theoretical perspective

The following section will present an overview of the theoretical concepts of cloud computing and SaaS to give a full understanding of cloud technology. They will be utilized to develop a theoretical framework that guides our findings of the changes to the role of MAs in a cloud setting.

2.2.1. Cloud computing

The phenomenon commonly known as cloud computing has radically changed the way information technology is delivered, deployed, used, maintained and paid for (Marston et al. 2011) and is proclaimed to be a key digital trend for organizations when forming their digital business strategy (Bharadwaj et al. 2013). It has changed the technological landscape for organizations whereby IT can be used as a competitive tool through reduced time to market, on-demand utilization, scalability and increased operational flexibility. Both practitioners and academics have attempted to define exactly what cloud computing is and the characteristics it presents. The National Institute of Standards and Technology [NIST] defines five essential characteristics of cloud computing - on demand self-service, broad network access, resource pooling, rapid elasticity and measured service - in order for it to classify as a cloud model (NIST 2011). Vaquero et al. (2009) provides a more general description, defining the cloud as:

> A large pool of easily usable and accessible virtualized resources (such as hardware, development platforms and/or services). These resources can be dynamically reconfigured to adjust to a variable load (scale), allowing also for an optimum resource utilization. (p. 51)

In essence, cloud computing enables organizations and individuals to access applications and data from anywhere in the world on-demand (Buyya et al. 2011), converging IT efficiency and business agility (Marston et al. 2011). The cloud can be used to rapidly scale up (or down) operations through the application based, pay-as-you-go model and it offers broad network access and the ability for resource pooling (Hofmann, Woods 2010, NIST 2011). Marston et al. (2011) describe the advantages of cloud computing as being service scalability, service innovation, a low-cost model, faster time to market and that it lower IT barriers to innovation. Cloud computing makes it easier for enterprises to scale their services to client demand since software can be developed and deployed much faster. The low-cost model is realized through a lower upfront investment and reduced capital expenditures of IT resources. This also lower entry barriers for enterprises seeking to start an IT related business and leads to a faster time to

market. Moreover, the notion of sharing resources could open up greater possibilities for innovation.

Other researchers (see e.g. Bharadwaj et al. 2013, Huang et al. 2015, NIST 2011, Vaquero et al. 2009) corroborate these advantages, pointing in particular to the lower cost of entry and deployment, immediate access to hardware resources, less upfront customization and increased operational elasticity. The cloud is thus described as an adaptive IT infrastructure that can be accessed and shared among different end users on-demand through any web application and a third party hosts your software on a remote server where they store and process your data. From the perspective of a large, diverse organization this should produce significant advantages considering the technology no longer have to be stored and developed in-house and its flexibility should aid in the integration process.

2.2.2. Software-as-a-Service

SaaS is a cloud-based alternative to the traditional on-premise software set-up that is becoming increasingly popular among enterprises (Feng et al. 2018, Hamerman 2014). SaaS is a software licensing and delivery method that enables enterprises to reduce physical hardware storage and outsource IT management and services. NIST (2011) defines SaaS as a service model where the capability provided to the consumer is to use the provided applications running on cloud infrastructure, with the consumer not managing or controlling the underlying cloud infrastructure.

Cloud related services are generally described as being more economical for enterprises due to flexible provision of services and other cost efficiencies (Huang et al. 2015). IT outsourcing has been described to have increased with the emergence of SaaS (and cloud computing in general) and refers to the use of a third party to provide IT services previously performed internally (Han, Mithas 2013, Hayes 2008). Han and Mithas (2013) found that non-operating IT costs are negatively correlated with IT being outsourced and hence corroborates the notion of cost efficiency related to cloud and SaaS solutions. Thus, SaaS makes it is easier for organizations to manage their resources, reduce costs and the outsourcing of IT development and maintenance produce more focused organizations.

SaaS and cloud-computing evidently share some characteristics and they are usually mentioned in unison or similar contexts. The difference is that cloud-computing enables enterprises to manage applications on a server hosted by a third party and access to your data is granted via the web. With SaaS, the user no longer maintains either the physical servers or cloud-based application software. You instead pay a subscription for using the providers already developed

applications with limited possibility for customization. Hence, SaaS entails giving up some control over the management and customization of your IT infrastructure. When the two terms work together consumers reap the benefits of easy to access, cost-effective software with the speed and reliability of their in-house systems (Buyya et al. 2011).

2.2.3. Cloud-based ERP systems

CERP systems are based on the aforementioned technologies and provide enterprises with new opportunities for efficiency and agility in managing their growing customer and IT demands. Just as traditional ERPs they include multiple organizational functions such as accounting, procurement and production but the software is no longer stored or developed in-house. Wan and Clegg (2010) refers to the combination of cloud technology and ERP systems as ERP III and provides the following definition:

> ERP III [CERP] is contingently defined by authors as a flexible, yet powerful information system incorporated web-based SOA [service-oriented architecture] and cloud computing version, which enables virtual enterprises to offer increasing degrees of flexibility, agility and dynamic amorphousness (p. 192)

CERP systems have been claimed to provide enterprises with several benefits not previously realized. Bryson and Sullivan (2003) argue it results in more efficient operations and the ability of managing cash flows more effectively by having predetermined monthly IT costs. The enterprise can focus on its core business and does not need to recruit and retain expensive IT personnel. Olson (2007) adds to this discussion by outlining the reduction in capital expenditure for ERP software and updates, continuous access to the latest technology, and more flexible and agile IT capability as cloud ERP advantages. He also recognizes some reasons against outsourcing, such as security and privacy concerns, vendor dependency and that ERP expertise is a competency critical to organizational success (ibid, p. 3). The security risk in particular is frequently mentioned in cloud computing literature (Saee et al. 2012), considering you have to put an essential part of your operations, and related data, in the hands of the vendor.

The below list summaries some key differences between traditional ERP systems and CERP systems. The list should not be considered exhaustive as it was constructed by the authors for illustrative purposes based on the above technical review.

System specifications	ERP	CERP
Location/development	*On-premise*	*Vendor*
Upgrades	*On-order*	*Automatic*
Customization	*Upfront*	*Limited*
Deployment	*Cumbersome*	*Fast*
IT service	*In-house*	*Outsourced*
System management	*In-house*	*Outsourced*
Expense	*Capital*	*Operational*
Scalability	*Low*	*High*
Flexibility	*Low*	*High*

Table 2: Main differences between traditional ERP systems and CERP systems. Authors' creation.

2.3. Theoretical framework

2.3.1. An integrated framework for studying the role of management accountants in a cloud-based ERP setting

Previous literature on the role of MAs has highlighted how the introduction of new technologies can act as a catalyst for role development (see e.g. Caglio 2003, Järvenpää 2007, Scapens, Jazayeri 2003). Furthermore, several articles argue that the role change is less to do with the actual system but rather a bi-product of how people interact with the technology (Dechow, Mouritsen 2005, Quattrone, Hopper 2005). By taking a holistic view of previous literature it becomes clear that the role of MAs and technological innovations must be studied in unison to fully understand the intrinsic drivers of role development.

The technology power loop (Newman, Westrup 2005, Scarbrough, Corbett 1992) depicts the relationship between expertise, technology and control and how it is influenced by internal and external actors. It can be viewed as a conceptual framework that depicts the battle between different organizational players, with the resulting mobilization setting the precedent for which type of MA role that ensues. However, cloud technology has the potential to produce significant alterations to the technology power loop as vendors gain more control through outsourcing, IT expertise is no longer needed in-house and system development is realized faster. Hence, the way the CERP system is structured is assumed to significantly impact the technology power loop and subsequently the role of MAs. The technology power loop is integrated with the technical specifications inherent to cloud technology in order to understand how CERP systems impact the role of MAs. The framework is shown in figure 1 and detailed explanations of the framework and integrated concepts are provided below.

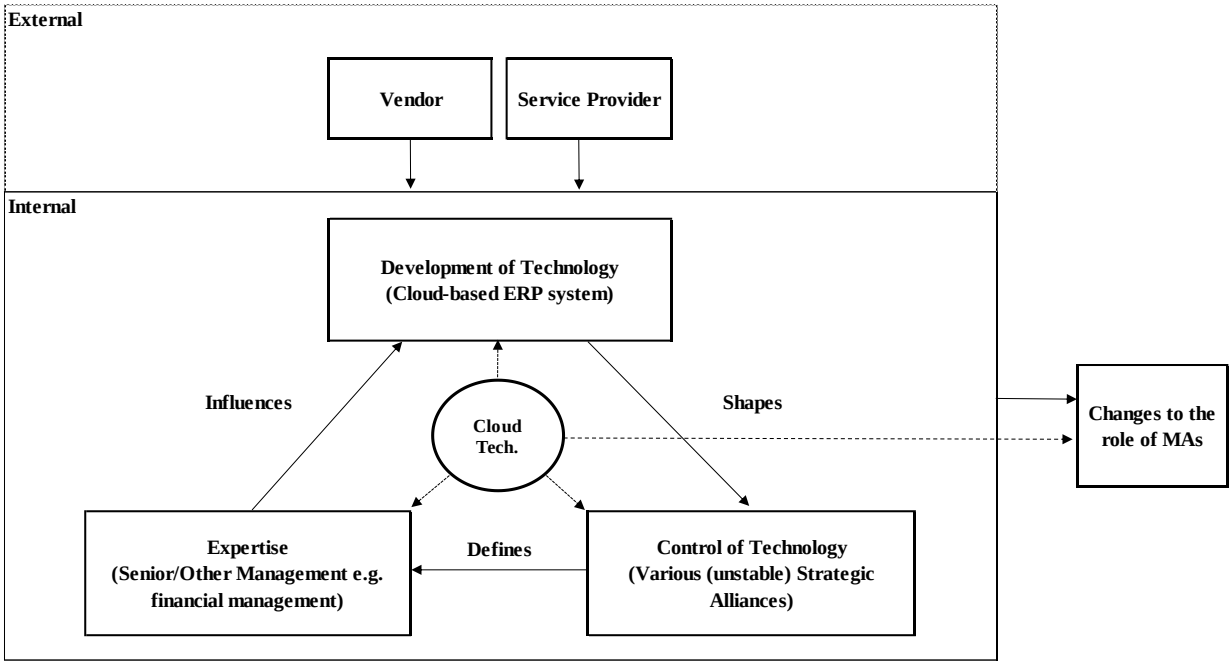

Figure 1: Theoretical framework. Developed from Newman and Westrups' (2005) technology power loop by incorporating cloud technology.

2.3.2. The technology power loop as a tool to understand the impact of technology on the role of management accountants

The technology power loop was first introduced by Scarborough and Corbett in 1992 and it describes the recursive relationship between expertise, development of technology and control of technology within an organization. It provides insight into how expertise influences the development of technology, how that development shape the control of technology, and how the control in turns defines expertise (Scarbrough, Corbett 1992). The dynamic relationship is in continuous rotation and presents a view of how expertise is constantly reproduced. If control over a technology is lost the expertise of a specific group might be altered and a marginalization of power can occur.

The model was later expanded by Newman and Westrup (2005) to explain how an ERP system is made to work, or consumed, and how different groups seek to influence its development. They find that the development of technologies is moved outside the organizations, resulting in distortion of the MAs monopoly of control. Control instead becomes dependent on other groups, exercised by strategic alliances that consists of employees from different parts of the organization. The destruction of the accounting monopoly shifts the expertise and knowledge from management accounting to senior management and/or other management groups. They conclude that the success of an ERP system is more than a pure technical issue, it is dependent

on the interaction with the system by both internal and external stakeholders; including MAs, management consultants, the vendors and other management groups (Newman, Westrup 2005).

The technology power loop provides an analytical tool for studying the interaction and enactment of technology among different actors within an organization. The way expertise, control and development of technology are reproduced has an effect on the development of the role of MAs as it affects the internal dynamics of the organization. Hence, the way in which expertise, development and control is mobilized subsequent to the introduction of a new technology has the potential to shift role specifics such as knowledge, intra-organizational interaction, power relations and practices.

2.3.3. Cloud technology and the technology power loop

Section 2.2. explained some of the differences between CERP systems and traditional ERP systems. Newman and Westrup (2005) demonstrates how the technical differences between legacy systems and ERP systems impacted the technology power loop developed by Scarbrough and Corbett (1992). It can be argued that a CERP system presents a comparable technological leap forward as it introduces automatic upgrades, improves accessibility and moves the system from the enterprise to the vendor. Combined, these technological aspects have the potential to impact or even transform the technology power loop. Operational differences such as outsourced IT services directly impacts the need for internal IT expertise in the company. In addition, as argued by Newman and Westrup (2005), external stakeholders, including vendors and consultants, impact the technology power loop. In a CERP environment, development, maintenance, upgrades and support is outsourced leading to external parties obtaining increased power and responsibilities. Lastly, differences such as increased flexibility and scalability creates more adaptable organizations. The technology power loop is a dynamic framework showing how expertise is constantly reproduced. As CERP systems produce more elastic organizations it should impact how decisions are made today, the relationship between expertise and technological development and how the role of MAs will develop.

3. Methodology

This section presents the methodology used for the study. In section 3.1. the research design and selection of case company is motivated. This is followed by a description of how data was collected in 3.2. and the structuration and analysis of the data in 3.3. We conclude by discussing the reliability and validity of the study in 3.4.

3.1. Research design

3.1.1. An exploratory single case study

Edmondson and Mcmanus (2007) present three different archetypes of methodological fit in field research; nascent, intermediate and mature. Research on the role change of MAs in an ERP setting can be said to be in a mature phase with earlier literature employing qualitative, quantitative and hybrid research approaches. However, there is limited (if any) literature on the role change of MAs in a cloud environment. Although this has been requested in earlier research (Grabski et al. 2011), it has to date been overlooked. Thus, according to the typology of Edmondson and Mcmanus (2007), the research field of this study can be categorized to be in a nascent stage. The aim of such research should be to identify patterns and develop theoretical propositions rather than rejecting or validating existing ones through hypothesis testing (Edmondson, Mcmanus 2007, Yin 2014). Furthermore, it is argued to be favorable to adopt a qualitative design in a field with little prior research (Eisenhardt 1989) as an inadequate understanding of the field might exist.

Two prominent approaches exist within qualitatively designed studies; multiple and single case studies. Multiple case studies are argued to offer analytical benefits such as cross-case analysis that have the potential to yield more powerful conclusions in comparison to single case studies (Eisenhardt 1989, Yin 2014). However, a single case study provides greater possibility for empirical depth and a deeper analysis of underlying complexities (Dyer, Wilkins 1991, Yin 2014).

An exploratory case study was adopted considering the general lack of literature on the specific subject and the novelty of the research question (Ryan et al. 2002). As such, rather than starting with a hypothesis or proposition for which to accept or reject, this study will act as a preliminary investigation aimed to generate new theories and insights and contribute to the understanding of the development of the role of MAs following the implementation of a CERP system (Edmondson, Mcmanus 2007, Ryan, Scapens & Theobald 2002). In addition, single case

studies have provided valuable insights in previous research on the role of MAs in an ERP setting (see e.g. Scapens, Jazayeri 2003, Hyvönen et al. 2015, Järvenpää 2007).

3.1.2. Abductive approach

It was deemed appropriate to employ an abductive approach in order to properly answer the research question. This approach can be seen as a reconciliation of two other approaches, the inductive approach and the deductive approach, commonly used in qualitative research. The inductive approach aims to develop new theories based on empirical findings while the deductive approach develops propositions based on existing analytical frameworks and use empirical data to test theories (Bryman 2012, Dubois, Gadde 2002). The abductive approach reconciles the two approaches by embracing qualities of both. It allows for the simultaneous collection, analysis and development of empirical data and theory where you continuously shift back and forth between the theoretical domain and empirical world (Dubois, Gadde 2002, Lukka, Modell 2010). This approach was considered suitable as the purpose of this study is to generate new insights to an understudied field and as it allows for continuous reformulation and alteration of the analytical framework as empirical data is collected.

As prescribed by the abductive approach, previous literature on the role of MAs and ERP systems were synthesized to obtain a deeper understanding of the current state of knowledge. The topic and research question were further specified as initial empirics were collected. As the study progressed and more empirics were collected and analyzed, interesting findings emerged both supporting and contradicting past literature. A revision of the theoretical literature and analytical framing was conducted throughout the study and the abductive approach proved fruitful as it enabled empirics and theory to mutually shape each other.

3.1.3. The selection of the case organization

The case organization is a large, internally diverse, public organization in Sweden comprised of several subsidiaries and public service organs. The subsidiaries, which will be the local focus of this study, are their own legal entities operating in different sectors and settings. The case company is referred to as PubliCo throughout the paper to preserve anonymity.

The reason for studying the selected case company is threefold. First, the sheer size and complexity of its operations was deemed interesting from an academic perspective. Secondly, Maxwell (2012) emphasize the importance of getting sufficient access in order to reliably collect data that provides relevant information for the research topic. The university's strong connections with the case company facilitated a favorable relationship with organizational actors and simplified data collection. Finally, previous literature has suggested that more

longitudinal case studies would be beneficial as it offers the possibility to study the development and change in the role of MAs over time (Goretzki et al. 2013, Granlund, Malmi 2002). Although a longitudinal case study is outside the scope of this paper, the case company implemented the CERP system in different phases, for different subsidiaries, spanning a total of four years. At least one subsidiary from each phase was selected in hope of yielding temporal findings similar to a longitudinal case study. When the study commenced, early subsidiaries had worked in the system for two and a half years and later subsidiaries had only recently finished the implementation and been in the system less than a year. The organization was hence deemed advantageous from a research perspective as it could provide insights into how the role of MAs changed over time.

3.2. Data collection

3.2.1. Primary data

Interviews were the primary source for empirical data and 20 interviews were conducted with 22 different interviewees between February 5th and May 8th 2018. The interviews lasted between 40 and 75 minutes, with an average of 65 minutes, and were all conducted at the local subsidiary or central offices. In line with Barlow (2010), the interviews were semi-structured in order to get a deep understanding of the role of MAs and how the CERP system affected its development. The first three interviews were standardized open-ended interviews (Patton 2002). These pilot interviews helped set the conceptual framing of the study and aided in formulating the research question. As the interviews progressed, more detailed questions were asked regarding daily work, routines, processes, relationships, communications and integration complexities following the introduction of the CERP system with an emphasis of the pre/post perception of their role. During the interview period we were able to continuously analyze and enhance the interview questions. The interview guide was also revised as unexpected findings emerged.

All interviews were conducted *in situ* and face-to-face. Both authors were present during all interviews (except one) reducing the risk of misinterpretation and ensuring all aspects of the interviews were captured. One author was the lead interviewer, asking the questions and navigating through interview guide, while the other mainly took notes and asked complementary questions if appropriate. Before the interview the lead interviewer ensured full anonymity with the interviewee and asked permission to record for transcribing purposes. Although audio recording can lead to more reflective, rather than in-depth expressive answers (Given 2008), it was deemed positive to be able to transcribe, reflect and listen to the recording

after the interview in order to capture all aspects of the answers provided. A list of the interviews is presented in the appendix.

3.2.2. Secondary data

In addition to abovementioned interviews, documents, both internal and publicly available, was used in the analysis. Documents is a good source for complementary data as it is stable, unobtrusive and broad in nature (Yin 2014) but should be viewed in the context of other sources of data (Bryman, Bell 2007). The documentation was therefore primarily used for increasing our overall understanding of the case organization and the technical process linked to the introduction of the CERP system. Furthermore, in line with (Yin 2014), the documents helped corroborate and augment evidence from our interviews. Most of the documents are publicly available reports, studies and exerts. However, some were obtained, after permission, during interviews and consisted of internal presentations depicting the organization and specific project information. Where appropriate, information from these documents have been used in the paper.

3.3. Data analysis

Data collection and analysis occurred simultaneously in line with the abductive approach described above. A short reflective discussion transpired after each interview where notes, interview answers and individual perceptions where compared and analyzed. This, combined with interview transcripts, were used for developing the interview guide and for identifying emerging themes to probe in subsequent interviews.

The narrative approach common for business and management research (Bryman, Bell 2007) guided our analysis of the collected data. A narrative analysis can prove helpful in making sense of the organization by relating the different interview accounts to episodes and the interconnectivity between them. One advantage is that it conveys a clear sense of the organization as a domain where multiple perspectives can coexist, rather than a monolithic entity with a single voice (ibid p. 531f.). Furthermore, a narrative approach is appropriate for this study as it seeks to shed light on an IT-system implementation and its effects on the role of MAs, avoiding commitment to any specific anchor point but rather evaluate the process or development over time (Langley 1999). Empirics where thematically categorized into the MA role (such as tasks, processes and relationships), specifics linked to cloud technology (such as outsourcing and flexibility) and organizational idiosyncrasies (such as control structures and system development) linked to the technology power loop. This allowed us to structure the

collected data and identify patterns, triggers and dynamics linked to the MAs role development following the CERP implementation.

3.4. Research quality

3.4.1. Validity

Validity relates to how well the outcome of the research reflects reality (Maxwell 2012, Miles et al. 2014, Yin 2014). Yin (2014) separates validity into three categories; construct, internal and external validity.

Construct validity concerns the design of the study, the concepts used and the measures related to those concepts. For high construct validity it is important to ensure that the research question in mind is actually studied and covered by the chosen measures (Dubois, Gadde 2002). Yin (2014) points out that case studies have been criticized for not adequately specifying the concept in focus, for failing to develop a sufficiently operational set of measures and for adding subjectivity into the data collection. He continues to provide guidance for how to increase construct validity, suggesting having multiple data sources, establishing a chain of evidence and having the draft case study reviewed by key informants as potential routes (ibid, p. 45f.). Two of these were applied in the study. Three sources of evidence have been used in order to triangulate data and enrich our empirics and the structuring of the findings following our analytical framework should allow the reader to logically follow the development of our conclusion by establishing a chain of evidence.

Internal validity is a debated concept in qualitative studies as it is argued to be too focused on quantitative aspects (Miles et al. 2014). Simply put, it is making sure that the observed changes in the dependent variable are primarily caused by the studied independent variables and not by some other exogenous variable (Ryan et al. 2002). Yin (2014) defines it as the existence of a causal relationship and argues that in exploratory case studies the search for internal validity is somewhat irrelevant seeing the purpose of such research is to generate new propositions rather than testing hypotheses. However, as internal validity also refers to credibility and authenticity in a wider sense, or truth value (Miles et al. 2014), it relates to interpretations made by researchers when collecting data. Thus, following this notion, actions were taken to ensure credible results and a high internal validity. Empirics from secondary sources were reviewed and similar questions were asked in multiple interviews in order to cross-validate evidence and secure the quality and objectivity of observed patterns. Furthermore, the interviews were constructed with internal validity and objectivity in mind by means of having open-ended

questions, generating transcripts and conducting individual analysis of the transcripts before empirical discussions.

External validity refers to the transferability or fittingness of the findings (Miles et al. 2014) and whether the research can be generalized beyond the actual study (Yin 2014). Generalizability have been observed as a challenge for case studies as they are bound by the contextual and environmental factors of the case itself (Dubois, Gadde 2002). Eisenhardt (1989) highlights this weakness by pointing to the potential of case studies generating idiosyncratic theories, i.e. theories only valid for the specific case. The problem with generalizability in a case study design is often associated with statistical generality. However, Yin (2014) argue that there exists a second kind of generalization, analytical generalization, which is the vital one in case study research, and he continues to suggest precautionary actions to increase it. Following this argument, we have grounded our analytical framework in existing theoretical concepts and the research question has been formulated in a way that is generalizable to other empirical settings.

3.4.2. Reliability

Reliability, also called dependability or auditability, refers to the extent other researchers can repeat the findings using the same procedure (Yin 2014) and if the findings are stable over time (Bryman 2012, Miles et al. 2014). Reliability can further be separated into internal and external reliability, where the former concerns the agreement of findings within the research team and the latter relates to the replicability of the study (Bryman, Bell 2007).

We attempted to minimize errors and avoid biases following the guidelines of Yin (2014) in an effort to increase external validity. Detailed research documentation has been applied throughout the study and a cloud database containing interview material such as questionnaires, audio files, transcripts, research notes and analyses was created. This database also stores internal and external documentation collected from interviews and public sources. Continuing, in order to ensure internal reliability, the interviews were prepared in collaboration and both authors were present during all interviews (except one). The interviews were transcribed within a week of their occurrence, with the work split equally between the authors, and random checks of each other's transcripts were made to increase objectivity. Finally, each interview was analyzed individually before collectively conducting the main empirical analysis.

4. Findings

This section presents the findings of the study. An introduction the case company and depiction of the CERP system is presented in 4.1. Our findings of the role changes of MAs in a cloud environment are presented with the guidance of our analytical framework. The development of technology, control of technology and expertise in a CERP setting are described in section 4.2., 4.3., and 4.4. respectively. Finally, we conclude with a short summary of the changes to the role of MAs in a CERP environment in section 4.5

4.1. Case organization and CERP system

4.1.1. PubliCo

The case organization [PubliCo] is a large city in Sweden providing public services to its inhabitants. The organization includes public service divisions such as city planning, culture, labor, sports, education, environment, elderly care, housing and traffic and employs in total roughly 40,000 people. In addition, the city incorporates several subsidiaries, or state-owned enterprises [SOEs], operating as their own legal entities under a parent company fully owned by the city. The SOEs are spread out across different industries including real estate, waste management, parking and IT infrastructure. The interviews were focused on the MAs located at the SOEs, the central IT team and the central MAs. The five SOEs included in this study were selected based on when they implemented the CERP system to get one SOE from each implementation phase. The below figure illustrates the organizational chart and where the interviews took place.

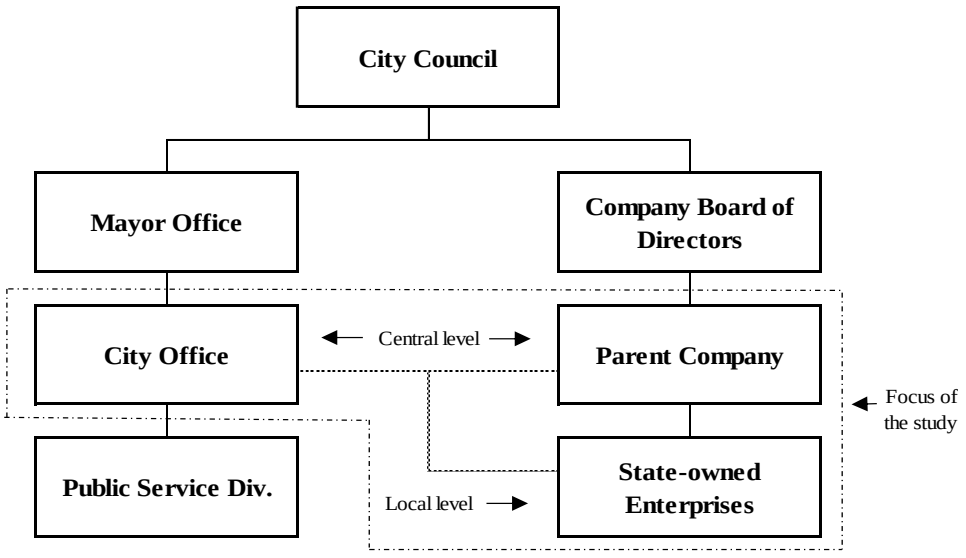

Figure 2: Organizational chart of PubliCo. Authors' creation.

The city office is responsible for governing and coordinating the city as a whole in aspects such as planning, IT development, administration and human resources. The finance department at the city office, consisting of roughly 40 employees, is responsible for drafting the budget proposal that is later approved by the politicians at the city council. This draft also includes the budget for the parent company and its subsidiaries. The city office serves a management function and has the responsibility to ensure healthy short- and long-term financing through active financial governance. The central IT team, roughly 10 employees, resides within the city office's finance department and is responsible for all central accounting and financial IT-systems, both at the public service divisions and SOEs. This team was also responsible for the CERP system implementation project.

The parent company can be compared to a holding company, controlling a group consisting of 16 SOEs, a dormant company and two associated companies. More than half of the SOEs have their own subsidiaries or subgroups. The parent company is owned by PubliCo and serves as a cohesive function for the city's limited liability companies. The SOEs conduct municipal activities by providing and delivering services to the city's inhabitants; which includes everything from housing, water supply, school buildings, port facilities and parking to tourist information and cultural services.

4.1.2. The CERP system

The suggestion to implement a CERP system at PubliCo was drafted by the finance department at the city office before being approved by the city council. A long pre-study was conducted where individuals from the public service divisions and SOEs were invited to come with suggestions on the specifications to be included in the public procurement documents. Vendors were then invited to bid on the project as long as they fulfilled the regulatory requirements mandated by PubliCo. Several bids came in and the central IT team decided on a vendor.

The system includes several modules such as procurement, accounting, inventory, project management and billing and serves a unified purpose of cloud integration. Additional systems such as local CRM systems were linked, or integrated, to the CERP system. The modules are fixed to a standard format that the SOEs must adapt and adjust their business to. The contract was drafted to include two external parties; the Application System Vendor [ASV] and the Service Provider [SP]. The ASV is responsible for development and updating the system and the SP oversees server maintenance, technical support, testing and implementations. The system is delivered through the cloud via a web application to over 14,000 active users. In case of a problem, either technical or process wise, the users will contact the SP for support. The

communication between the ASV and PubliCo is conducted solely by the central IT department. This communication mainly revolves updates and development requests. The system was implemented gradually through several phases in order not to expend the central IT team.

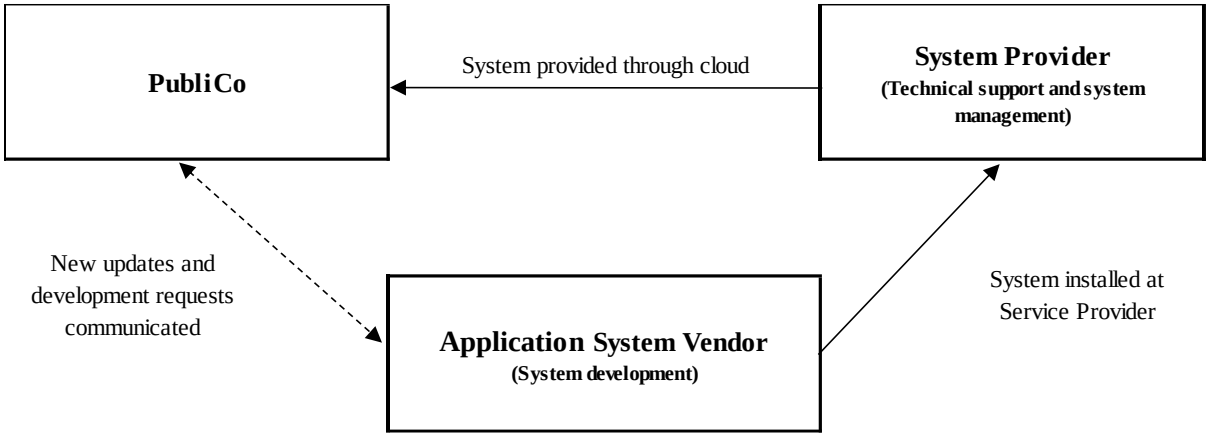

Figure 3: Illustration of system set-up and communication flow. Authors' creation.

Four main goals were set for the CERP project and highlighted in the official project documents. These were increased reporting efficiency, increased cost efficiency, decreased administrative work and easier future system development. These correlate well with what the literature on cloud technology, presented in section 2.2., describes as potential advantages from adopting a cloud-based IT infrastructure. Increased cost efficiency was the most common goal mentioned by our interviewees, both at the central and local teams, with the strong consensus that a reduction in IT systems would drive down total IT expenditures. This was underpinned by statements such as "joint development must be cheaper" and "having one common system instead of eight must reduce costs". However, while the belief of a lower overall cost was there, none of our interviewees had received any information to whether this was true or not. Only one SOE had seen a decrease in their own IT costs, and it was hardly a large one, while the rest saw significant increases. One company even had their system related costs increase by as much as 400%. Many local MAs expressed concerns whether the central IT team actually knew the total cost of the project.

> I don't think that we have reported our costs to the central project team. I haven't done that at least. I wonder if the central team have a clear picture of the total costs (MA_2, SOE_3)

Towards the end of our study the implemented CERP system actually won an international award for best public ERP solution, with supporting arguments that the implementation was finished ahead of time and below budget. This again raises the question if the project team had a clear picture of all the additional costs that had incurred at local level after the system was

implemented. In later interviews with the central office when the topic of costs was discussed, the financial evaluation was described as limited due to fear of losing future department funds.

> There is a risk that if you start talking about projects in terms of cost reductions and saved money, the politicians will come and reduce your budget. So, we don't perform any financial analysis. I have put a stop to it (Director$_1$, Central Finance)

4.2. Development of technology and the changes to the role of MAs

> Now that everyone has the same system it has become such an enormous machinery. We are now part of a giant inflexible apparatus. You need to go through several levels, meetings and managers…it has become so slow. It feels like the Soviet Union. It is not flexible at all (MA, SOE$_4$)

A key feature of the system, and one of the motives for implementing it, is the centralized management of the IT development process. The central IT team have adopted a stronger position as the driver of efficiency and technological advancements. Prior to the introduction of the CERP system the SOEs fully owned their own systems and could change and develop them at their own will. This was described as a pain-free process where the MAs would work together with local IT in implementing the requested developments. With the introduction of the CERP system the development was partially moved outside the organization to the external ASV and SP. It shifted from being locally handled by the MAs and local IT to a collective affair between the SP and central IT. The local MAs saw, to a varying degree, their tasks circumscribed and system authority reduced. At the same time, the central MAs remained unaffected mainly due to never having been involved with IT development in the first place.

The communication with the ASV was removed from the SOEs to be handled solely by the central IT team. This loss of authority led to frustration among several local MAs.

> Before, I had full access and I could just go into the system and change it. Now I don't have any authority to do that (Senior MA, SOE$_2$)

The system development process was now divided into two categories, smaller and larger alterations. Smaller alterations or adaptions could be requested by the SOE directly from the SP and this interaction was perceived as fairly smooth. However, for larger alterations the local MAs described the processes as highly cumbersome.

> We cannot control the development of the system. We can only ask for it from the central IT office. It is a slower process now. We used to have a lot more

> freedom in the old system…where we could develop it ourselves with that vendor, but now we must go through the city every time (MA_1, SOE_1)

The initial step was to contact the SP which evaluated the scope of the request. If they perceived it to be a larger development request then the central IT office would be contacted and involved. They would then do an internal valuation to see if the proposed changes were something only the requesting SOE needed or if it could benefit the city as a whole. If the latter was true then the request was approved. One MA explained how their request of a special adoption critical to their business had been rejected, resulting in the CERP system not being able to communicate with their old billing system. In order to solve this problem, the MAs were forced to prepare data in the old system and then manually transfer it to the CERP system. Another MA was luckier in getting her request approved but also faced difficulties. She frustratingly described how their request had been on a priority list for two years without being resolved. The long development procedure forced local MAs to work with sub-optimized processes, in effect reducing the time available for analysis. This problem was not evident among central MAs as their focus were on financial analysis and performance management on an aggregated group level rather than system optimization.

4.3. Control of technology and the changes to the role of MAs

4.3.1. Transparency and locus of accountability

With the implementation of a standardized way of reporting, a uniform "master data" template was created. Each SOE had to report in a prescribed way following a template formed by the central offices where several previously individual accounts had to be consolidated into one. This produced more comprehensive representations of the organization and enabled management to effectively follow-up and evaluate on a group level. However, major efforts were needed from the SOEs to construct this uniform data as their previous, highly customized, set-up of processes and code had to be changed to accommodate for city-wide uniformity. Several MAs saw this mandate as intrusive and failed to see the advantages gained from altering their previous arrangement. When asked what had been communicated from the central offices, one MA described this antipathy:

> The unified account-plan was to be able to see things together. But there weren't many benefits for us. I felt like when looking at the aim this weren't for us but for someone else (Senior MA, SOE_4)

True, one of the motives of implementing the CERP system in the first place was to improve the reporting for the city as a whole with the sub-intention of increased transparency. However, it is not surprising that some MAs opposed this as they were used to be highly independent in their daily operations. Transparency can be perceived as invasive as it projects the feeling of being looked at, or surveilled, usually by people above you. The general perception from the interviewees, both at local and central level, were that the SOEs were, and should, be highly autonomous. The argument was that they know best how to run their respective businesses and as long as they created tangible value for the organization they were, in large part, left alone. As one local MA described it:

> If there is anything, [the parent company] ask us, what is this?, and they want us to explain…but they never go into our numbers hands-on. I think it is like this, as long as you are a profitable company and deliver what you are expected to deliver, they are pretty laid-back (Senior MA, SOE_2)

The increased transparency brought forth by the system was actually perceived as positive from most of the interviewees. Arguments such as "we got nothing to hide" or "it will make reporting easier" were frequent but delivered with a sub-tone of confidence that the decentralized operational structure would prevail even in a centralized system. All local MAs were confident that central management would not intervene in more detail than before even though they now have the option to do so.

A consequence from increased visibility is usually that the locus of accountability, or where the responsibility resides, changes as you are now perceived as an individual rather than part of a collective. You have your own account and password that gives you agency with the system and your individual actions can be traced by time and event should you be held accountable. Online reports can be produced at any time and the central MA function have the possibility of performing granular analysis whenever needed. However, individualized accountability did not really materialize in PubliCo because of the prescribed notion of autonomy. The central MAs perceived the increased visibility as something good but were not themselves in the actual system to collect data or reports for evaluation. One central MA did not even know if he had access to the system and continued to describe a de-coupled process of sending Excel files between the central offices and SOEs instead of himself pulling the data from the system. To keep up the façade of SOE autonomy, local CFOs or MAs must manually copy-paste data from the CERP system to the Excel file.

> I get the data in the format I want it from the SOEs. However, it would be nice for them if they didn't have to fill out my Excel sheets. It is the SOEs that do the work, I´m not left suffering. They would probably think it's better if I looked straight into their system and was able to pull data from there…But they should probably feel that they are self-governed (MA_2, Parent company)

The locus of accountability thus remained within the perimeters of the SOEs as central management and central MAs did not utilize some of the functions and features the system provided. For example, built into the reports of the consolidation module was a function referred to as "drill-back", which enabled central MAs to drill down from consolidated account numbers to the individual accounts and transactions. This visibility feature portrays at least the possibility of individual accountability but remained unutilized at central level due to the idea of SOE autonomy. The central MAs merely acknowledged that the function existed but it should not be used as it invades the independence of the SOEs. The SOEs as a collective are in charge of making sure the numbers are correct and are held accountable as a unit rather than on an individual level. This notion was also described from the perspective of acting on incorrect data. Although the system provided visible real-time information, central MAs were reluctant to go into the numbers since it risks acting on incomplete information and instigating a chain of unnecessary problems.

4.3.2. Designing control features

A series of controls were designed into the system orchestrated by the central IT function together with the SP. Limitations or authorizations based around access were implemented where local MAs (and others users) were restricted in what they could do and what parts of the of the system they had access to. By limiting system use there is an inadvertent effect on the role of MAs as they now must conform to the prescribed modes of communication and processes. Indeed, this set-up with the SP seems to have been one of the least appreciated features of the new system. A feeling of powerlessness was often described among local MAs as they saw stricter limitations to what they could do in the system. Several interviewees explained they had difficulties letting go of tasks they had previously performed themselves to the SP, pointing in particular to the cumbersome process it now entailed. Simple things such as adding a new user or removing a specific row in the system-reports were described by one MA to have gone from taking fifteen minutes to three days. However, positive effects such as the high competence of the SP were also highlighted.

Some MAs mentioned that system visibility had been reduced. The SP, presumably buttressed by the central IT team, had reduced the amount of data the local MAs could use or even look at. Restrictions were introduced that hindered efficient communication between the local MAs and other parts of the SOEs, creating bottlenecks in some instances. This was observed to cause ripple effects as the output of one MAs work was the input of someone else's, hindering analysis several information nodes down the line.

> I'm happy with the system, it's working with it that's the problem...We used to have administrative system rights, and it's good we don't have to manage that anymore, but we can feel limited in the sense that we cannot see things. It's not possible, you have to ask the SP...I think being able to go in and look for myself would solve things faster and you wouldn't have to involve the SP (Senior MA, SOE_5)

The common notion of "who is in charge of the information is in control" can, however, be questioned. The SP was, in a sense, owner of the information as it was removed from the organization onto their servers. But, of course, they were not in a position to use that information. So perhaps control of technology in an outsourced IT environment should not be viewed as whom is in control of the actual information, but rather the one that directs and construct its flow.

4.4. Expertise and the changes to the role of MAs

The CERP system was positively described by the central MAs and attested to have simplified monitoring and follow-up. The drivers were argued to be the increase in data quality and more flexible reports. In the old system the SOEs had to manually transfer data from their local systems into the group reporting tool, representing a significant error source for the central MAs as there was a possibility for local MAs to input incorrect actuals. The new system minimized this risk by automating the information flow and thus reduced the time spent on data input around reporting dates. However, this was not received in an entirely positive light. While the local MAs recognized the reduction in manual work, the deadlines for tertial reporting had been preponed by a couple of days. Consequently, there was zero-sum effect of the automatization seeing that the reporting process had to be commenced earlier.

It was frequently remarked by the central MAs that the CERP system had improved data quality and made them feel more secure in the numbers. Increased transparency and automatization

allowed less record-keeping activities and seeing that they now trusted the numbers they had the possibility to focus on more business-related goals rather than purely financial follow-up.

> Now that the figures are more transparent, less time must be spent checking the numbers and instead we can focus more on analysis and follow-up (CFO, Parent company)

The limited upfront customization distinctive to cloud technology proved to be a two-sided coin. Although it produced an opportunity for greater analysis at central level, however not fully utilized, and better reports across the organization, it was frequently described to have created more manual work for local MAs. Prior to implementation each SOE had highly adapted legacy systems servicing their particular business. By shifting to the CERP system they were forced into a standardized format of new practices and work processes creating a sense of immobility. Local MAs described their old systems and way of working with positive words such as flexibility and ease of use, while adopting a more negative tone towards the new system.

> It has become tiresome...we actually had a very good system before that worked perfectly. Now there are several steps and several things to keep track on. Now everything needs to go through several systems. It has not remotely become more flexible (Senior MA, SOE_4)

As one of the main project goals was to create a standardized way of working it was decided that every local adoption to the off-the-shelf cloud format had to be evaluated and approved by the central IT function. The central IT team described themselves as being very strict on the number of system modifications allowed and actually ended up approving less than ten percent of SOEs' suggestions. It is not then surprising that most local MAs found the system to be insufficient for optimal value-added operations as a number of critical alterations were rejected. The most conspicuous illustration of the CERP system's inflexibility was an accounting practice at one SOE. Due to the complexity of the business model and being characterized by long-term contracts, the SOE has to recognize revenues and costs over periods stretching years into the future. The new system only permits having one year at a time open for accruals and hence presents a significant problem the SOE have to work around. They are now forced to put the contracts down as assets in another module and at every closing they have to manually extract the data from there. It takes several processes to get the right numbers and the task has gone from taking a couple of minutes to several days, even forcing the local MA to work weekends.

The general, not surprising, notion from the interviewees is that the additional manual processes take up precious time that otherwise can be spent on more value-generating activities. Increased manual work reduce their ability for analysis and intra-business advisory.

> Time was absolutely more value-creating before. There is no mental thinking in this [current] process and you lose the analytical part. There is no time for it now since you are so focused on manually putting figures into different sheets (MA, SOE_4)

Problems with the limited upfront customization were also observed in SOE_5. Its business is heavily reliant on customer data stored in a local CRM system and their former legacy systems were specifically designed to communicate and transfer this data efficiently. To the senior MAs' clear frustration, the new CERP system was unable to fill this position and failed to interact with the local CRM system. Even after numerous discussions with the central IT team the SOE was rejected the necessary adaptions that were needed to solve the problem. The resulting solution was to keep the old CRM system for preparing invoices and then manually transfer these into the new CERP system, leading to slower processes that steal time and reduce analysis for the local MAs. This set-up was actually described as completely worthless by a local senior MA.

While the central MAs shared a general consensus of how the CERP system had enabled for easier analysis, no such consensus was found among the local MAs. Most of them described similar experiences as the one above with the introduction of additional time-consuming manual processes. These processes emerged as a consequence of the new system not working with their local business requirements. However, some described their overall analytical work to have been unaffected. One interviewee described how any efficiency gains lead to higher demands from central offices of providing more information, basically cancelling out the time saved.

It was described in the previous section that control over the CERP system was enacted through an alliance between the central IT function and SP. As the local MAs exercised control over their old system it was their expertise that influenced its development. But as control shifted to central IT it was their expertise that now influenced the system. In an interview with one of the senior system developers who had acted as the project leader for the CERP implementation, it was explained how his department had grown and taken on additional responsibilities following the CERP introduction. In his view the strategic development and planning had been centralised and the central IT department now had a larger role within the organisation.

> We [the central IT team] have two responsibilities. The first is making sure the system works. We purchase that service externally. The users [of the system] call our service provider if they need support. Our second focus, our main focus, is strategic. What should we do? How should we do it? What projects should we go for? What are the effects? What choices should we make? (Senior System Developer, Central Office)

4.5. Summary of the changes to the role of MAs in a CERP environment

Previous sections depict the journey the MAs at PubliCo went through when implementing a CERP system and it is evident that the SaaS solution with the ASV and SP impacted the internal dynamics of the organization. The local MA role seem to have been circumscribed because of the limited upfront customization that cloud technology entails. By going from previously customized systems to a standardized way of working the local MAs were re-focused towards its own department through a reduction of system and process freedom. This was further spurred by the outsourcing of IT services and system management that reduced the need for local IT interaction. Seeing that the SOEs' operations are highly disparate from one another, implementing a homogenous set of work practices (through the design of the system) created a myriad of problems and forced local MAs to implement new manual processes in order to maintain business flow. Most argued that these sub-optimized processes took up time otherwise spent on analysis and value-creation, insinuating a more financially oriented role for the local MA.

The CERP system seems to have had little effect on the role of the central MA. This could have been the result of the organizational structure itself or the role the parent company is supposed to have. Nonetheless, the central MAs were reluctant to make use of the increased visibility the system brought forth in order to preserve the autonomy of SOEs. The only observed system advantage at central level came from simplified group reporting where a unified set of data was compiled. This was probably buttressed by external stakeholders (such as auditors) and a way of showing organizational unity by having everyone report in a similar way. However, the central IT team seems to have gained significant authority by being process and system owners of the CERP system. Together with the SP they exude significant power, directing information flows and controlling the system. Their role became more strategic since management of the system was outsourced and development was now a joint effort between the central IT team and external parties. Although local MAs could petition for alterations or improvements, their suggestions had to go through the SP first before finally being decided upon by central IT. It

seemed as if only customizations that proved valuable for the organization as a whole were approved, leaving local SOEs with mediocre processes and little influence over system development. Table 3 summarize the observed changes to the role of MAs in PubliCo following the CERP system implementation.

	Pre-CERP	Post-CERP	Changes to role of MAs
Development of technology	Joint-development between local IT and MAs. Group reporting systems developed by central IT.	Central IT in collaboration with SP and ASV.	Central MAs unaffected. Local MAs system-authority reduced. Long development process forced MAs to work with sub-optimized processes that reduced time for analysis.
Control of technology	Resided within each SOE's accounting function. Local MAs with IT expertise.	Collective affair between central IT and SP.	Central MAs unaffected due to their unwillingness to change work practices. Local MAs circumscribed due to standardization and in-system limitations.
Expertise	Management accounting.	Central IT team with strategic knowledge.	Modest effect on central MAs. Local MAs reduced to more financial rather than strategic expertise due to an increase in manual processes and a reduction of IT interaction.

Table 3: Summary of changes to role of MAs.

5. Discussion

In this section the findings regarding how the CERP system impacted the role of MAs in PubliCo are discussed and compared with previous literature. The discussion will be structured as follows. Section 5.1. investigates the findings related to the bean counter and business partner role and questions previously assumed notions of binarity and transition in a CERP system. Section 5.2. address marginalization and hybridization in a cloud-based setting. Section 5.3. depicts the observed incongruity in role development following the CERP implementation. Finally, we conclude our discussion by presenting a revised technology power loop in section 5.4.

5.1. From business partner to bean counter?

Our findings suggest that the prominent view of a transition from bean counter to business partner among MAs can be put to question. At the local level, the system set-up inhibited a business partner role to materialize because of newly introduced processes and adaptivity limitations, effectively re-focusing the MAs towards their own department. Similar to the findings of Hyvönen et al. (2015), we thus argue that the transformation in the role of MAs is not as unidirectional as previous assumed and a reversion back towards the bean counter can occur.

Prior to the introduction of the CERP system, the central MAs at PubliCo could be described as being somewhere on a spectrum between bean counters and business partners as they engaged with both financial and non-financial information in a forward-looking manner but remained isolated to the accounting function. Similar to Scapens and Jazayeri (2003), our findings showed how the CERP system led to the elimination of some manual work and an increase in transparency and trustworthiness of the figures. While this, in theory, could have led to an increase in analytical work, it was largely left unutilized. Central MAs upheld previous SOE-autonomy by exercising decentralized centralization (Quattrone, Hopper 2005), where SOEs were treated as black boxes only represented through periodic accounting representations. While the CERP system and its cloud characteristics presented an opportunity for central MAs to redefine their expertise and adopt a more strategic role, it was instead used to reinforce existing practices and routines (similar to the findings of Granlund, Malmi 2002 and Quattrone, Hopper 2005). Direct changes to the role of MAs were not observed at central level and hence supports the implication that the interaction and use of the system defines the role, rather than it being a bi-product of the technology itself (Abbott 1988, Hyvönen et al. 2009).

We witnessed a different role development among local MAs. As has been observed in previous literature, traditional ERP systems are prone to produce a business partner role for the MAs as they create company-wide real-time information that enables for greater analysis (Evans et al. 1996, Granlund, Lukka 1997, 1998, Malmi 2001, Yazdifar, Tsamenyi 2005, Windeck et al. 2015). CERP systems share several attributes with their on-premise counterparts in terms of data consolidation and real-time information (Wan, Clegg 2010), but differ in their promise of greater flexibility and improved accessibility (Buyya et al. 2011). Moreover, the outsourcing of dreary responsibilities and increased standardization should, in theory, create an even greater opportunity for the business partner role to emerge. However, this was not the case in our study. The local MAs expressed frustration over the inflexibility the system produced as new manual processes had to be implemented to keep general operations in momentum. Although some routine tasks were eliminated through outsourcing, the time saved was offset by increased complexity in other processes. Analytical and value-generating work that had previously occupied the accounting function was reduced and the MAs attention was redirected towards dealing with the intricacy of organizational *vis-á-vi* system fit.

As opposed to an on-premise ERP system, SaaS-delivered systems are more restrictive with upfront customization (Bharadwaj et al. 2013, Huang et al. 2015, Mell, Grance 2011, Vaquero et al. 2009), as it is basically a comprehensive software package delivered as an application hosted by the vendor. The organizational fit of a traditional ERP system has been seen as a key factor in explaining the success or failure of its implementation (Hong, Kim 2002). It is argued that to increase the chance for implementation success, process adaptation (i.e. operational change) is a safer choice than ERP adaptation when the organizational fit of the system is low (ibid). Our findings contradict this statement. The generic, standardized CERP system imposed rigidity as it was not entirely compatible with company specific requirements and not as functional as the legacy systems to which it replaced. However, it should be noted that success can be defined in many ways, but we argue that the problems that occurred (mainly at local level) was a direct result from having to deal with process adaption to the new system.

The CERP system thus enforced a standardized structure to which the central IT team took on the responsibility of identifying appropriate ways of working, how information should be disseminated and, to some extent, how users should act on that information. It can be likened to trying to fit a square piece into a round hole by shaping the organization to the desired form. By redefining the mechanisms of information provision, the role and necessary expertise of

MAs are redefined (Newman, Westrup 2005) where the business partner role is one, albeit ambivalent, outcome.

5.2. Less threat of internal marginalization, but no hybrids

In contrast to previous literature showing the possibility of a diffusion of accounting knowledge subsequent to the introduction of an ERP system, a phenomenon labeled hybridization (Caglio 2003, Hyvönen et al. 2009, Scapens, Jazayeri 2003), we did not find any evidence of traditional accounting work being removed from MAs to some other group in the organization. The case of PubliCo hence indicate that perhaps the threat of marginalization of the role of MAs is lower in a CERP environment. Quite surprising considering that increased information accessibility, a driver for hybridization, is a key feature of cloud technology as data can be retrieved over the web (Buyya et al. 2011).

Another frequently discussed aspect of hybridization of the MAs following an ERP is a transfer of system tasks and responsibilities from the finance department to the IT division (Caglio 2003, Newman, Westrup 2005). However, no such transfer became evident in PubliCo. We instead saw a marginalization of the local IT department, perpetrated by the SP and the central IT team, as their responsibility was reduced to services concerning legacy systems not covered by the CERP system or other administrative tasks. Consequently, the threat of marginalization of local MAs from IT professionals was thus reduced seeing that local IT had nothing to do with the new system. Instead, the SP became the point of contact for questions and development requests.

Our findings suggest that the local MAs could be described as hybrids prior to the system implementation. They were in a better position to exercise control and worked together with local IT (and legacy vendor) in developing the system to the organizations specific needs. Given the above discussion of marginalization, one could assume that this hybrid role would continue in the new system as well. However, we argue that this did not occur and instead a new form, which we label "*de-hybridization*" emerged, emphasizing how the MAs had been hybrids but reverted back to a more classic accounting and financial role following the implementation. As opposed to marginalization, the term de-hybridization signifies that rather than traditional accounting tasks being stripped away from the MAs, it is the tasks that created the hybrid role in the first place (in our case related to IT) that was removed.

Newman and Westrup (2005) indicates that if MAs actively engage in reshaping their expertise it could lead to control remaining within the accounting function while neglecting to do so

allows other for organizational actors to wrestle control away from MAs. We suggest that due to system characteristics, local MAs were not in a position to influence neither development nor system usage. Comically put, local MAs did not have to wrestle for control as there was no control to wrestle over. The CERP system perpetrated a sense of containment as it hindered the mobility of information between MAs and other groups through reduced in-system visibility. Caglio (2003) remarks this mobility feature of tools and techniques as crucial for the hybrid role to ensue. The system restrictions prevented local MAs from intra-organizational development and complete visibility, and hence reduced the need for interaction with IT and hindered the interaction with other departments. So although the threat of marginalization is internally reduced in an outsourced cloud-based environment, the possibility of a hybrid role (at least locally) is perhaps also reduced.

5.3. Heterogenous role development

In most of previous literature MAs are simplistically lumped together and portrayed as one homogenous group. Considering these studies acted as the basis for our research question we initially adopted a similar view. However, our findings indicate that the role of MAs and its changes are not as homogenous as formerly presumed.

An intra-organizational perspective when studying the role of MAs has largely been overlooked by earlier literature. MAs has been viewed as an internal collective instead of acknowledging the potential of internal incongruence in MAs role development. Some research has recognized the possibility for multiple roles, contesting the stereotypical bean counter and business partner (Lambert, Sponem 2012, Nilsson, et al. 2011). However, a weakness to these studies is that they are conducted across multiple organizations and hence uphold the notion of homogeneity within organizations. It is only recent literature that depicts a sense of internal dynamics to the role of MAs (El-Sayed, El-Aziz Youssef 2015, Mack, Goretzki 2017, Paulsson 2012).

Two factors have been proclaimed as drivers for role change in an ERP setting; the technical specifications of the system itself (Caglio 2003, Järvenpää 2007, Scapens, Jazayeri 2003) and the usage or interaction with the system (Dechow, Mouritsen 2005, Hyvönen et al 2009, Quattrone, Hopper 2005). Our findings from the central level in PubliCo indicates that the MAs' role was rather unaffected. This was perpetrated by a strongly held perception that SOEs should be left autonomous in their operations. The CERP system allowed for the extraction and usage of an increased amount of company data leaving central MAs with an opportunity to centralize control and improve analysis. However, their indisposition to get more involved hindered them

from fully assuming a business partner role and hence they remained in their quasi-like state. It seems that the (un)willingness of the central MAs to make us of system specific advantages reproduced existing roles and routines. This supports the research that questions the significance of the actual technology and instead argue for system usage as the intrinsic driver for role change. At the local level our findings suggest that both the technology itself and how it was used drove role change for MAs. By shifting from previously customized systems to a standardized CERP system MAs were forced to create separate manual processes, leading to less time spent on analysis. In addition, the system set-up of limited visibility reduced communication with other departments. Our findings thus indicate that the changes to the role of MAs are not as homogenous as previously assumed. There exists a multiplexity among roles within organizations and the line between bean counter and business partner is fluid (in line with the findings of El-Sayed, El-Aziz Youssef 2015, Mack, Goretzki 2017 and Paulsson 2012).

The two SOEs with by far the most negative views of the CERP project were SOE_4 and SOE_5 and the MAs within these were observed to experience a stronger reversion to the bean counter. It is somewhat unsurprising to learn that these two were last to implement the new system and hence had spent the least amount of time up-and-running when our study commenced. The negative views mainly concerned the new manual processes previously described. On the other hand, the two SOEs that were in the first implementation phase expressed more neutral attitudes towards the CERP system, indicating that the reversion that occurred might fade as time progresses. It was described that as comfortability and usage efficiency increased, the problems that some of the manual processes created diminished. We argue that these findings introduce a duality to the notion of drivers for change, implying that they are not mutually exclusive but can in fact co-exist in larger organizations.

Furthermore, the time perspective on usage supports Granlund and Malmi (2002), who suggested that the effects on MAs following an ERP implementation might take time to materialize. However, a correction of that statement would be that the effects occur instantaneously but their significance change over time. Similar to El-Sayed and El-Aziz Youssef (2015) who argues that the role of MAs is dependent on the constellation of different "modes of mediation", we found that MAs' role changes was contingent not only on technological specifications or system interaction, but also on the spatial setting (organizational level) of the accounting function.

5.4. Revised technology power loop in a cloud environment

With the above discussion in mind we suggest some changes to the technology power loop. Newman and Westrup (2005) acknowledge that external parties impact the technology power loop in an ERP setting, but only to a lesser extent. We propose a realignment of the border between internal and external parties and their effect on the technology power loop in a cloud-based environment. As argued by Newman and Westrup (2005), an ERP system is consumed rather than produced within an organization. The notion of commodified systems is taken to a new level through the CERP system and its SaaS delivery method as the system is essentially a service and not a product. These technologies involve a greater degree of standardization and provides fewer possibilities for business adjustments (Saeed et al. 2012). Our findings suggest that the organization needs, to a larger extent, adapt to the system and not vice versa. This represents a loss of authority over system design leading to the development of technology being partly moved outside the organization.

The control of technology is also partially moved outside the organization as it is shaped by the development of technology. In a traditional ERP setting, control of technology resides with various, unstable, strategic alliances that try to exert influence over the system. This depicts the internal struggle that might follow an ERP introduction and Newman and Westrup (2005) acknowledge the possibility for a marginalization of the accounting function. We, however, observed a substantial marginalization of the local IT function, orchestrated by the SP and central IT team, after the introduction of the CERP system. The SP was given significant responsibilities such as IT support, authority clearance and partial system development while the local IT department's operational tasks were reduced. In addition, much of the strategic work related to the system was transferred from the local accounting function to the central IT team. Thus, we argue that the control shifted from being a local affair shared between MAs and local IT to a strategic alliance consisting of the central IT department and SP.

We argue that expertise remains fully within the organization. However, the inflexibility of the CERP system created additional manual work for the local MAs and reduced their time spent on analysis. At the same time, while the CERP system provided central MAs with an opportunity to take on a business partner role, their unwillingness to change previously set process and modes of communication hindered this transformation. Moreover, we did not witness any centralization of accounting tasks and we saw no reductions in local accounting teams. Hence, the type of expertise needed from the MAs seems to depend on where in the organization they are located. At the central level the MAs expertise remained unchanged as

they resisted in expanding their organizational domain, while at the local level the MAs expertise became more centered on financial knowledge. However, the central IT team expanded their area of expertise to include strategic development of the system and organizational work processes. Thus, the expertise that influenced the development of the technology resided with the IT function at central level; the gate-keepers for development requests.

Seeing that it is a recursive model it follows that external parties now have greater impact on the role of the MA, as is evident by our findings and illustrated by the revised TPL below, but this impact is disparately distributed based on where the MA is situated.

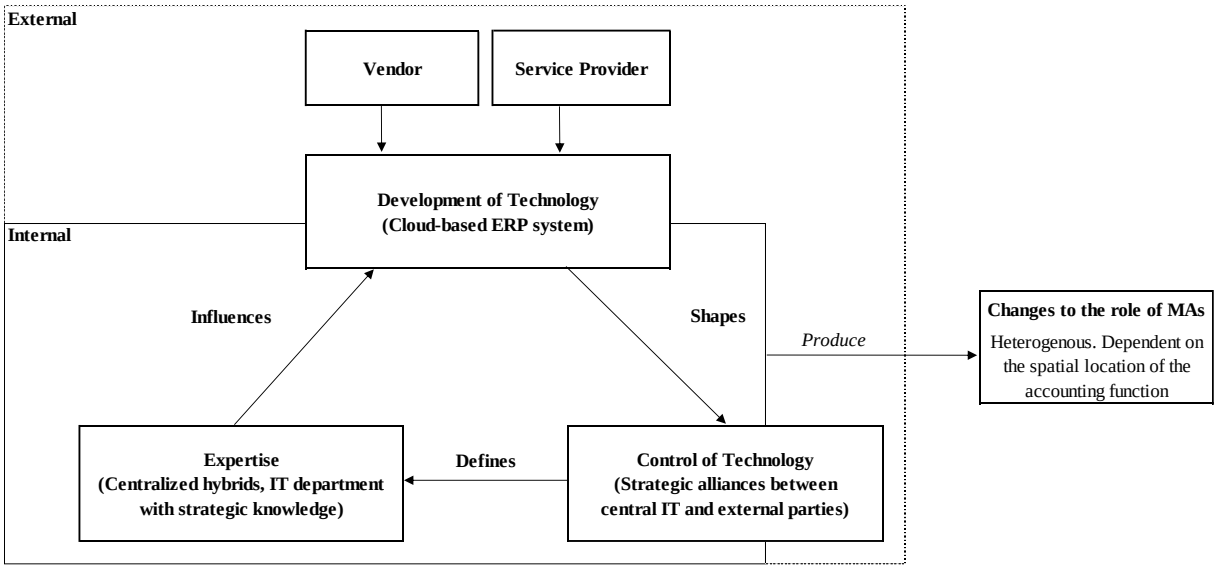

Figure 4: Revised technology power loop contextualized to a cloud environment.

6. Concluding remarks

This study contributes to the existing literature on the role of management accountants [MAs] in an Enterprise Resource Planning [ERP] setting by drawing on concepts relating to cloud-technology. While previous research has presented valuable contributions to our understanding of the effects of traditional ERP systems on the role of MAs, there is no present studies that explores how cloud-based ERP [CERP] systems and its inherent characteristics impact and change the role of MAs in organizations. Empirics were hence gathered through an exploratory case study of a recently implemented CERP system in a large public organization.

A heterogenous role development was observed depending on where in the organization the MAs were located. We found that the role of central MAs was rather unaffected due to their (un)willingness to expand their domain and take advantage of the transparency and accessibility the system produced. This supports the notion that system usage rather than technology dictate role change. In contrast, local MAs seems to have been circumscribed by system specifics such as outsourcing of development and increased standardization. We argue that the enforced standardization of work practices among the local MAs was a direct result of the limited upfront customization inherent to cloud technology. It forced them to create separate manual processes to preserve business mobility and time for analysis was hence reduced. This potential of incongruent effects from ERP systems has largely been overlooked by previous research. MAs have been simplistically lumped together into a homogenous group and a catalyst, such as an ERP implementation, is studied from a holistic standpoint and hence ignore the possibility that MAs can be affected differently depending on to which organizational level they adhere.

Furthermore, concepts such as bean counter and business partner have, in large, been viewed as absolutes, "either or" notions. Our findings suggest that this binary view is too simplistic and a broader spectrum is at least conceptually possible. Similar to El-Sayed and El-Aziz Youssef (2015) and Mack, Goretzki (2017), we conclude that there exists a multiplexity among roles within organizations and that the line between bean counter and business partner is more fluid than previously depicted. Moreover, our findings propose that the move from bean counter to business partner that is argued to follow an ERP implementation is not as unidirectional as previously assumed, at least not in a CERP setting. Similar to the recent findings of Hyvönen et al. (2015), we found a reversion back to the bean counter role among local MAs where the financial focus increased instead of them adopting the prescribed business partner role. This was driven by the limited upfront customization associated with the CERP system as it led to an increase in manual work.

Additionally, existing literature speaks of hybridization in two forms; either as a diffusion of accounting knowledge (Kurunmäki 2004 Newman, Westrup 2005, Scapens, Jazayeri 2003) or accountants broadening their expertise into other non-accounting fields (Caglio 2003, Burns, Baldvinsdottir 2005, Byrne, Pierce 2007, Hyvönen et al. 2009, Newman, Westrup 2005). Interestingly, a third form, which we label de-hybridization, emerged in our case organization resulting from the system no longer being stored in-house. The local MAs were previously in a joint-position with local IT in influencing and developing the system in congruence to the organizations specific needs. As the CERP system no longer is hosted at local sites and influence over its development is reduced, a de-hybridization of the local MAs was observed. The MAs were re-focused towards their own department seeing system restrictions prevented them from intra-organizational development and complete visibility, reducing the need for interaction with IT and hindering the interaction with other departments. This also further spurred the reversion towards a more financially oriented role described above. Finally, this thesis adds to the literature on the technology power loop, arguing that development and control of technology is shared among internal and external stakeholders in a cloud-based environment.

7. Limitations, practical implications and future research

7.1. Limitations

The purpose of this study has been to gain an understanding of the role change of MAs following the introduction of a CERP system. Single case studies are argued to provide in-depth understandings of a particular phenomenon but produce less generalizable findings due to the skewness of organizational particularities and the contextual setting to which the study adheres. However, as described in the methodology section, the research question was formulated with existing theoretical concepts in mind to enable for higher degree of generalizability. Nonetheless, more research is needed in different contexts that can corroborate our findings.

A longitudinal case study would have been preferred as previous literature indicates that role changes, and positive attitudes for that matter, take long to materialize. This means that our answers could be negatively portrayed considering the recentness of the CERP implementation. However, the local SOEs were selected based on when they entered the system in order to generate some longitudinal merit to our findings. Nevertheless, future research would benefit from a longer study period to gain more details of the role development of MAs following cloud-based technologies. Furthermore, our study was conducted during the spring of 2018 while the CERP system implementation stretched from 2014 to 2017. As the events discussed in the interviews occurred in the past, there is a risk that the interviewees memories have been distorted or some details have been forgotten, leading to an ex-post rationalization of their answers.

Another limitation concerns the honesty in the answers of our respondents. However, all interviews began by clearly reinsuring the anonymity of the interviewees' answers as well as their organizational belonging. In general, our interviews were informal and everyone we met seemed to share and describe their honest opinions. While most of our interviewees had the same organizational position during the implementation phase and today, a few interviewees had different positions during the actual implementation. This could mean that their views of the implementation phase do not fully represent their current position, but rather their former. To mitigate to risk of incorrectly drawn conclusions caused by untruthful answers and answers not representative of their current organizational position, we regularly questioned the answers given by our respondents and the findings of earlier interviews were discussed in later interviews. In addition, similar questions were asked in several interviews to triangulate data.

7.2. Practical implications

The findings and conclusions presented in this paper may have practical implications for managers planning large-scale IT implementation projects, especially cloud-based systems. First, the system knowledge and lessons learned from the implementation should be kept within the organization. Throughout our interviews we noticed that the SOEs had employed different approaches to handle the increased workload of the implementation phase. SOEs with a more negative attitudes had let their MAs focus on their daily work while external consultants worked on the implementation. In contrast, the SOEs that expressed more positive views towards the implementation and CERP system overall had all brought in additional resources to help with their daily operations, leaving their own MAs focused on system implementation and creating internal motivation. Hence, the first practical application of our study is that external consultants should be brought in to help with routine operational work, allowing for internal staff to concentrate on system implementation. This leads to the knowledge being kept within the organization after the consultants leave.

Related to the point of additional resources is the aspect of work environment. Several local MAs described the immense pressure at work during the implementation phase and how several employees had to go on sick-leave due to stress, where some even remained on sick-leave one year after finishing the implementation. Hence, we suggest managers pay close attention to the environment these projects create during roll-out and develop action plans on how to deal with the increased workload.

The central IT department asked local MAs to join the project team when drafting the system specifications used in the public procurement documents. While several of our SOEs participated, two SOEs chose not to due to lack of resources. It is not surprising to find that these SOEs expressed significantly more negative views of the project management group and CERP system overall. We therefore recommend organizations that plan to commence a similar project to try and involve MAs and managers from all parts of the organization in order to create unified momentum and motivation among employees.

With regards to the novelty of cloud technology, we propose that organizations meticulously map out their operational processes and previous system linkages to ensure full business mobility after implementation. Furthermore, we suggest that the contact with the service provider should remain within the local IT units. Both parties speak the same language and local IT have operational expertise, with regards to system specifics, that the service provider does not. Moreover, our findings suggest that the prescribed CERP system advantages might

not materialize as expected or enterprises can have a hard time reaping the benefits that cloud technology is set out to provide. It could be that CERP systems are not yet entirely optimal for internally diverse domestic organizations or multi-national corporations and only SMEs can secure the advantages promised by the technology. Indeed, managers should evaluate if cloud technology will actually improve value creation and not adopt it just to portray an image of being digitally innovative.

Finally, within our case organization there was no uniform view of the cost efficiencies following the implementation. Several local MAs claimed that the central project team did not have a clear and comprehensive picture of all the additional costs that occurred post roll-out. Thus, organizations should make sure that they develop a detailed cost follow-up model to obtain an understanding of all the additional costs experienced at local level.

7.3. Future research

Given the nascent stage of the literature on the role of management accountants and cloud technology there are multiple interesting avenues for future research. The general suggestion implied in previous sections is for future researches to conduct a longitudinal case-study to study the effects of CERP systems on the role of MAs over time. This would generate in-depth findings on how perceptions, attitudes and usage develop across the different phases.

As mentioned in the discussion and conclusion we found that the CERP system produced a heterogenous role development depending on where in the organization the MAs were located. A more in-depth study focusing on the spatial impacts of the role of MAs could be beneficial to further probe the reasons as to why this might occur. This is an understudied area that we argue deserves more attention. Previous literature simplistically lump MAs into a homogenous group and fails, in large, to recognize the potential for multiplexity of roles within organizations. Theories from other domains, such as the MNC literature or institutional logics, could serve as interesting perspectives as they incorporate concepts of intra-organizational complexities and the relationship between headquarters and peripheries.

Furthermore, although control of technology was explored in this study, control in general in a SaaS or cloud-based environment is an interesting avenue for accounting research. What are the implications on power relations and management control when the IT infrastructure is outside the organization? How should you account for vendor risk? How should management control systems be designed? Future studies are needed that address the implications, uses, risks

and control features in this new setting and if CERP systems produce different organizational effects compared to traditional ERP implementations.

During our study we witnessed how the central IT department used its project team to create motivation among the local SOEs. However, as the local MAs satisfaction of the system varied, we would encourage future research to investigate the role project teams have in creating internal motivation among staff when implementing a new technology and what actually triggers acceptance from MAs in changing systems. Furthermore, related to the topic of motivation, throughout our interviews it became apparent that the willingness of MAs to change was a defining factor for their attitude towards the new system. It would be interesting if future research adopted a sociological perspective when studying MAs role development and cloud technologies. This could also apply to the topic of work environment and how the perceived well-being of the MAs during the implementation phase affect the success or failure of the project. Finally, cloud-technology implies that external parties, such as vendors or service providers, gains a larger role in the technology power loop and thus have a larger impact on the role of MAs. We suggest for further research into the relationship between external parties and MAs and in particular how they affect the role and professional development of the field.

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Appendix

Interview	Role	Department	Date	Time
1	Senior System Developer	Central IT	05/02-2018	73 min
1	System Developer	Central IT	05/02-2018	73 min
2	Director	Education Department	14/02-2018	63 min
3	Senior Management Accountant	SOE_5	02/03-2018	72 min
4	Senior System Developer	Central IT	06/03-2018	75 min
4	System Developer	Central IT	06/03-2018	75 min
5	CFO	Parent Company	09/03-2018	73 min
6	$Director_1$	Central Finance	12/03-2018	70 min
6	Management Accountant	Central Finance	12/03-2018	70 min
7	$Director_2$	Central Finance	14/03-2018	69 min
8	$Management\ Accountant_1$	Parent Company	14/03-2018	71 min
9	Senior Management Accountant	SOE_2	15/03-2018	61 min
10	Accountant	SOE_2	15/03-2018	53 min
11	Senior Management Accountant	SOE_1	19/03-2018	69 min
11	$Management\ Accountant_1$	SOE_1	19/03-2018	69 min
12	$Management\ Accountant_2$	Parent Company	16/04-2018	56 min
13	Senior Management Accountant	SOE_4	18/04-2018	65 min
14	Management Accountant	SOE_4	18/04-2018	47 min
15	$Management\ Accountant_2$	SOE_1	19/04-2018	58 min
16	$Management\ Accountant_1$	SOE_3	24/04-2018	70 min
17	Management Accountant	SOE_2	24/04-2018	64 min
18	Management Accountant	SOE_5	25/04-2018	65 min
19	$Management\ Accountant_3$	Parent Company	26/04-2018	40 min
20	$Management\ Accountant_2$	SOE_3	08/05-2018	51 min