

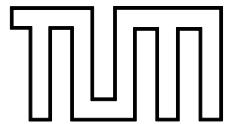
DEPARTMENT OF COMPUTER SCIENCE
TECHNICAL UNIVERSITY OF MUNICH

Master's Thesis in Information Systems

**Investigating Socio-Technical Factors of Cloud
Migration Projects – Insights From Theory and
Practice**

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DEPARTMENT OF COMPUTER SCIENCE
TECHNICAL UNIVERSITY OF MUNICH

Master's Thesis in Information Systems

**Untersuchung Sozio-Technischer Faktoren bei
Cloud-Migrationsprojekten – Erkenntnisse aus
Theorie und Praxis**

**Investigating Socio-Technical Factors of Cloud
Migration Projects – Insights From Theory and
Practice**

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Submission Date: 17.06.2024



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Abstract

In recent years, cloud computing has become a fundamental pillar of digital transformation. The adoption of cloud computing involves a wide range of socio-technical factors that are not fully understood in academia and practice, posing challenges for organizations embarking on cloud services. To close this research gap, this thesis explores the socio-technical factors of cloud adoption, focusing on the intersection of people, technology, and organization. To achieve this goal, I conducted a structured literature review and a multiple case study, unfolding challenges, best practices, and success factors that are associated with cloud adoption. I synthesized the findings of these two research approaches, resulting in a socio-technical framework that assists cloud practitioners in their journey to the cloud. Among other aspects, findings reveal that organizations must provide their employees with the opportunity to acquire the necessary cloud skills, establish organizational cloud units, communicate the value of the cloud clearly, and allow employees to practically explore the benefits of the technology to overcome resistance. This thesis not only provides a starting point for further research about the socio-technical effects of cloud transformation, but also provides actionable insights to help organizations navigate their cloud transformation.

Keywords: Cloud Adoption, Cloud Migration, Cloud Transformation, Digital Transformation, Literature Review, Multiple Case Study, Socio-Technical.

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List of Abbreviations

AIS	Association for Information Systems
AWS	Amazon Web Services
CapEx	Capital Expenditures
CoE	Center of Excellence
FRQ	Future Research Question
GCP	Google Cloud Platform
IaaS	Infrastructure as a Service
IS	Information Systems
IT	Information Technology
MVP	Minimum Viable Product
OpEx	Operational Expenditures
PaaS	Platform as a Service
RQ	Research Question
SaaS	Software as a Service
SIG	Special Interest Group

1 Introduction

1.1 Motivation

Digital transformation has gained much attention across industry sectors and academic circles over the past years (Vial, 2019). This term describes a company-wide phenomenon that has widespread organizational effects, notably altering the core business model through digital technology (Agarwal et al., 2010; Iansiti & Lakhani, 2014; Verhoef et al., 2021). The motivation to embark on this transformation stems from the evolution of digital technologies, shifts in customer behavior, and increased digital competition, for instance (Verhoef et al., 2021).

Many organizations employ cloud computing to achieve a successful digital transformation. This technology can be defined as “a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction” (Mell & Grance, 2011, p. 2). In a survey of 500 US companies, Deloitte found that 88% of respondents view cloud as the cornerstone of their digital strategy (Domes et al., 2022). In a recent Bitkom study, 89% of 554 surveyed German companies stated that they were actively using cloud technology (Rohleder, 2023). The study also found that every ninth company relies on a cloud-only approach, and that companies are planning to expand their cloud usage significantly (Rohleder, 2023). In another 2023 survey, KPMG found that 97% of German companies with at least 50 employees rely on cloud computing, and 82% even employ a multi-cloud strategy, which means they rely on more than one cloud provider (Gutjahr, 2023). As of 2023, companies that do not use cloud technologies are the exception (Gutjahr, 2023). Companies like Amazon, Microsoft and Google have developed extensive cloud platforms that offer a wide range of services. Gartner (2024) expects the worldwide market size for public cloud services to reach over 824 billion USD in 2025. These results illustrate the high and ever-increasing importance of cloud technology in practice.

Reasons why companies set out to leverage cloud technologies are manifold. A survey among practitioners identified increasing efficiency, developing new approaches, and reducing costs as the top three strategic priorities of cloud investments (Domes et al., 2022). Academia found operational cost saving, application scalability and efficient resource utilization to be the most frequent reasons why companies transition to the cloud (Jamshidi et al., 2013). Further benefits of the technology encompass increased productivity, collaboration, and support in data analytics, for example (McAfee, 2011).

Besides such benefits, organizations also face challenges when integrating cloud services. One challenge is the technical complexity of migration projects, especially when an organization has a heterogeneous landscape of legacy information technology (IT) systems, often referred to as *legacy spaghetti* (McAfee, 2011). Further, while moving to the cloud typically decreases infrastructure expenses, it increases costs when transferring data from the organizations on-premises to the cloud or vice versa (Dillon et al., 2010). Cloud integration can also raise security concerns, as data is migrated to shared environment beyond direct control (Ali

et al., 2015). These examples illustrate the importance of technical, financial, and security-related considerations in cloud initiatives.

However, the impact of cloud adoption on organizations extends beyond purely financial and technical aspects. For instance, cloud adoption can significantly alter IT roles and responsibilities, as it changes the way IT services are procured, deployed, and managed (Sabi et al., 2016; Vithayathil, 2018). McAfee (2011) argues that employees who are specialized on on-premise computing are skeptical about cloud computing, and thus rather CEO's and senior executives should push the shift to the cloud. A 2022 survey by Deloitte identified insufficient skilled staff and a lack of time as the two main barriers of cloud migration projects (Domes et al., 2022). Further examples for risks that concern the organizational impact of cloud adoption encompass deterioration of customer service quality, decrease of satisfying work, and departmental downsizing (Khajeh-Hosseini et al., 2010). In general, cloud transformation entails complex decision making, as a multitude of benefits, risks, and costs have to be assessed (Khajeh-Hosseini et al., 2012). These insights show that the integration of cloud services is not solely a technical endeavor, but rather an interplay of technology, organizational structures and the people involved or affected.

Considering the high practical relevance of cloud computing, there is still surprisingly little research on its socio-technical impact. Research has focused on financial, technical, and security-related factors of the technology (Sabi et al., 2016). However, the organizational impact has been examined less thoroughly (Vithayathil, 2018). While academia has equipped practitioners with manifold technical guidance for the migration of individual systems (Menzel et al., 2015; Pahl et al., 2013), the broader concept of cloud transformation in the enterprise context has not been investigated thoroughly from a socio-technical perspective. This master's thesis aims to close the gap between the practical relevance of cloud services and the current state of Information Systems (IS) research by exploring the role of socio-technical factors of cloud adoption. Combining insights from existing literature on the one hand, and experience of professionals from different industry sectors on the other, the thesis takes a holistic, qualitative research approach. The results draw upon 44 sources analyzed in the course of a structured literature review (Webster & Watson, 2002) and 20 interviews conducted with cloud experts in the course of a multiple case study (Yin, 2014). Focusing on the intersection of people, technology, and organization, this thesis aids practitioners in recognizing potential challenges and devising strategies for successfully navigating the journey to the cloud. Organizations that take advantage of the findings from this study can increase their chances of a smooth transition and ultimately advance their digital transformation.

1.2 Research Questions

The overall goal of this master's thesis is to gain a better understanding of the role of socio-technical factors of cloud adoption efforts by employing qualitative research methods. The thesis also sets out to have a practical impact by providing guidance for organizations that are integrating cloud services. To achieve these goals, I investigate three interrelated research questions (RQs), of which one is divided into two parts. Initially, I examine fundamental aspects of cloud adoption, and ultimately, I develop recommendations to help organizations successfully navigate their cloud transformation. I take both a theoretical perspective from

existing literature and a practical perspective through a multiple case study. These are the research questions:

RQ 1: *What approaches can organizations employ to adopt cloud services?*

The first research question deals with the fundamentals of cloud adoption. To build a solid foundation, I explore different types of migrations as well as processes that organizations can employ to integrate cloud services. To examine RQ 1, I conduct a structured literature review (Webster & Watson, 2002). The investigation of RQ 1 serves as a foundation for the next research question, which is divided into two parts:

RQ 2.1: *What socio-technical factors influence the success of cloud adoption in organizations?*

RQ 2.2: *What are challenges and best practices associated with cloud adoption?*

As cloud adoption can be a complex endeavor with multiple actors and roles involved, the focus of this research question is on the intersection of people, technology, and organization. Thus, I investigate what socio-technical factors have an influence on cloud adoption, what challenges organizations face, and what best practices they employ to overcome these challenges. To answer RQ 2.1 and RQ 2.2, I leverage insights from both a literature review (Webster & Watson, 2002) and a multiple case study (Yin, 2014). The primary source of evidence for the multiple case study are expert interviews (Myers & Newman, 2007) with cloud practitioners, supplemented by archival data. Synthesizing the previously obtained insights leads to the final research question:

RQ 3: *What are recommendations for organizations to facilitate the socio-technical shifts necessary for cloud transformation?*

This last research question emphasizes the practical application of the previously obtained knowledge. It consolidates the findings obtained in the previous research questions to derive actionable recommendations for organizations that are undergoing a cloud transformation or planning to do so. I provide a socio-technical framework consisting of recommendations that practitioners can utilize to achieve a smoother journey to the cloud. Figure 1 shows how the research questions relate to each other and how I approach them methodologically.

1.3 Thesis Organization

The remainder of the thesis is structured as follows. Chapter 2 serves as a foundation for the subsequent chapters. It explains important terms and concepts of cloud computing, such as essential cloud computing characteristics and different cloud service models. The third chapter presents the methodological approaches I took to answer the research questions. This includes the literature review process and the multiple case study design. Chapter 4 is dedicated to RQ 1. It presents an overview of cloud adoption approaches, laying the foundation for the following research questions. The fifth chapter addresses RQ 2.1 and RQ 2.2 with insights from literature, while Chapter 6 explores these questions from a practical perspective by presenting the results of the multiple case study. Chapter 7 synthesizes the insights obtained from

the previous research questions. It addresses RQ 3 and results in a socio-technical cloud transformation framework that guides cloud practitioners in their migration initiatives. This chapter further discusses the theoretical and practical implications of the thesis, including an agenda for future research. The final chapter wraps up the thesis by stating its limitations, giving an outlook on future work, and providing a conclusion.

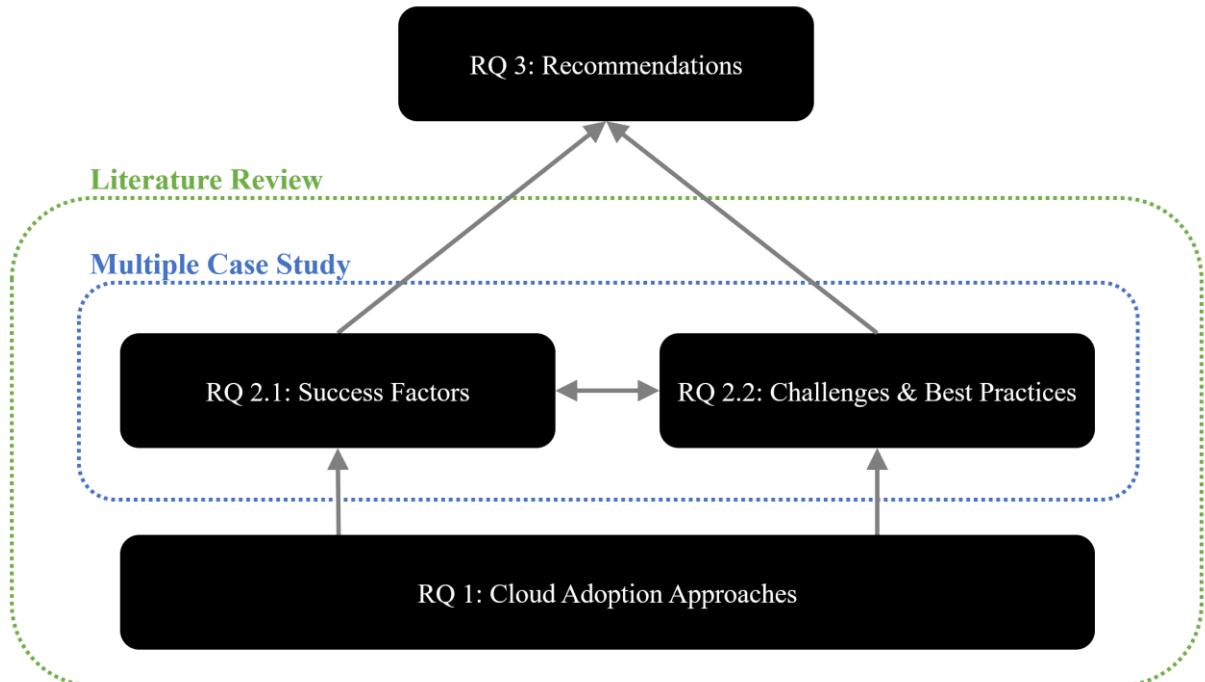


Figure 1: Research Questions and Methods

Source: Own Representation

2 Theoretical Background

This chapter provides an overview of important terms and concepts which are vital for the remainder of the thesis. I also outline the current state of IS research on cloud adoption.

2.1 Terminology

In this thesis, I differentiate the terms *cloud adoption*, *cloud transformation*, and *cloud migration* as follows. *Cloud adoption* is the general term used to describe the introduction of cloud computing technology within an organization, independent of its scale and impact. Thus, cloud adoption may refer to the integration of a single system, application, or process, or encompass a larger set. *Cloud transformation* describes a situation where the cloud adoption substantially affects parts of the organization, for example its processes, business model, workforce, or system landscape. In contrast, *cloud migration* refers to the act of shifting specific applications, services, processes, or data to the cloud. To summarize, a cloud transformation has a large scope in an organization and typically consists of many cloud migration projects, while cloud adoption is used as a more general term to describe the introduction of cloud services, independent of their scale and impact on the organization.

I use the term *hyperscalers* to refer to the cloud providers Amazon Web Services (AWS), Microsoft, and Google. These are the three cloud computing market leaders (Statista, 2024a).

2.2 Cloud Computing

2.2.1 Definition and Characteristics of Cloud Computing

In the introduction, I provided a widely used definition of cloud computing according to the National Institute of Standardization and Technology, which describes cloud computing as a model that provides omnipresent, easy access to a network on demand, allowing users to utilize a shared collection of computing resources that can be quickly allocated (Mell & Grance, 2011). This institute further views the following five characteristics as essential for cloud computing:

On-demand self-service: Users can autonomously allocate computing resources, such as server time and network storage, without the necessity for direct human interaction with service providers.

Broad network access: Services are accessible via the network using standard methods that encourage utilization across a wide range of client platforms, including mobile devices, tablets, laptops, and desktop workstations.

Resource pooling: The cloud provider combines computing resources in a shared environment to serve multiple customers through a multi-tenant model, dynamically allocating both physical and virtual resources based on customer needs. The customers are typically unaware of the exact resource location but have the option to specify a broader location preference, for instance by country.

Rapid elasticity: Resources can be flexibly allocated, sometimes automatically, to quickly expand or contract in response to demand, giving consumers the impression of limitless and on-demand capabilities.

Measured service: Cloud systems employ automated resource management and optimization through metering at a suitable level of abstraction, which varies based on the service type (e.g., storage, processing, bandwidth, or user accounts), allowing for monitoring, control, and transparent reporting of resource utilization for both service providers and users.

Virtualization

To achieve these characteristics, a wide range of technologies is utilized. One fundamental concept of cloud computing is virtualization. It is an approach that enables the efficient sharing and allocation of physical computing resources among multiple virtual machines on a single physical server (Bourguiba et al., 2013). Modern cloud providers like AWS or Microsoft Azure enable users to create virtual machines with only a few clicks, allowing them to tailor the computing environment to their specific requirements without needing to invest in dedicated physical servers.

2.2.2 Cloud Service Models

In the context of cloud computing, the term service refers to the ability “to use reusable, fine-grained components across a vendor’s network” (Velte & Elsenpeter, 2010, p. 11). Services typically are device independent, scalable, and multi-tenant (Velte & Elsenpeter, 2010). Several cloud computing service models have emerged, each fitting different technological and business-oriented requirements. The three most widely used service models are Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). They are characterized as follows.

Infrastructure as a Service: This service model provides fundamental IT infrastructure components like storage, processing, and networking resources (Dillon et al., 2010). Virtualization is a key concept in an IaaS cloud, giving organizations flexibility and control over their resources by adjusting to increasing and decreasing demand of users (Dillon et al., 2010). Companies can choose IaaS when they want to maintain their autonomy in configuring and controlling their applications and services. Examples of IaaS solutions on the market are DigitalOcean and Amazon Elastic Compute Cloud, also often referred to as Amazon EC2.

Platform as a Service: In contrast to IaaS, this service model has a higher level of abstraction by hiding the complexity of the infrastructure. It provides a platform of tools, services and frameworks that assist developers in creating apps and services themselves from the internet without the need of installing software (Velte & Elsenpeter, 2010). Examples of PaaS offerings include SAP Business Technology Platform and Microsoft Azure App Service.

Software as a Service: This model has the highest level of abstraction among the three mentioned. SaaS enables users to access applications that are managed and operated by the vendor in a cloud environment (Mell & Grance, 2011). Examples of SaaS include Jira Cloud, Confluence Cloud, Microsoft Teams and Zoom. In the SaaS model, services are accessible via the browser (e.g., Jira Cloud and Confluence Cloud) or via a client app that must be installed on

the user's device (e.g., Microsoft Teams and Zoom) to connect to the cloud-based services like messaging and video conferencing. Some vendors also offer both options, for instance by providing a client app specifically for mobile use. Note that a vendor may or may not decide to offer a given software in different versions. For example, customers can decide between the cloud and self-hosted on-premise version of GitLab, whereas Microsoft Teams is only available as a cloud version.

2.2.3 Cloud Deployment Models

Several deployment models for cloud services have emerged. I describe these briefly in the following.

Public cloud: In a public cloud, cloud resources and services are owned and operated by a third-party cloud service provider (Mell & Grance, 2011). The resources are made available to the general public via a pay-as-you-go pricing model (Armbrust et al., 2009). A public cloud is typically operated at a location of the provider (Liu et al., 2011). Benefits of this service model compromise no upfront financial investment and risk transferring to the provider (Zhang et al., 2010). Prominent public cloud providers include AWS, Microsoft Azure, and Google Cloud Platform (GCP).

Private cloud: A private cloud is dedicated to a single organization and can be located on or off-premise (Mell & Grance, 2011). Private clouds offer greater control and security than other deployment models, while also allowing for lower data transfer costs from the local infrastructure than the public cloud (Dillon et al., 2010). The organization can either manage the private cloud by itself, have a provider manage it, or manage it together with a provider (Mell & Grance, 2011).

Community Cloud: A community cloud is shared by several organizations with similar interests or requirements. It is a collaborative model that provides a dedicated cloud infrastructure to a specific community of users. Like the private cloud model, it can be run by the organization, a provider or both together. (Liu et al., 2011; Mell & Grance, 2011)

Hybrid Cloud: A hybrid cloud combines elements of at least two other deployment models (e.g., private and public cloud), allowing data and applications to be shared between them while the respective clouds remain distinct entities (Mell & Grance, 2011). Hybrid clouds are suitable for organizations that have specific requirements for some of their data and services (e.g., regarding security) while the scalability of a public cloud can be leveraged for other workloads (Venter & Whitley, 2012).

2.3 Research Gap

Thus far, IS research, sitting right in between the technical and social sciences (Sarker et al., 2019), has lacked to provide a socio-technical framework for cloud transformation. While the technical aspects of cloud computing have been extensively researched within the computer science community, the management sciences have devoted less attention to this technology. For example, a search on Scopus for the term *cloud* in the titles, abstracts, and keywords of the FT 50 journals (Ormans, 2016), a set of 50 highly reputed journals in the management

field, yields 116 results as of June 2024. Excluding three journals that also appear in the Basket of 11(AIS, 2023), a collection of 11 highly regarded IS journals, only 79 articles remain. Among these, many do not address cloud computing at all, or only touch on it peripherally. Searching for *cloud computing* instead of *cloud* in the very same setting yields only 27 results. To further illustrate the argument, searching the FT50 journals, excluding the three IS journals, for the terms *cloud migration*, *cloud adoption*, and *cloud transformation* yields 0 results each. Regarding the 27 results for *cloud computing* mentioned above, most of these papers either focus on pricing from the view of the provider (e.g., Fazli et al. (2018), Chen et al. (2019), and Dierks & Seuken (2022)), or mathematical optimization problems in the context of cloud (e.g., Hartline & Lucier (2015), Pu & Garcia (2018), and Perez-Salazar et al. (2022)). The influence of the technology on organizational units, roles, responsibilities, or corporate culture has been neglected. It is surprising that the broader organizational impact is so little represented in management science, especially given its enormous practical relevance, exemplified by its expected market value of 675 billion USD in 2024 (Gartner, 2024). Likewise, much of research on cloud computing in the reputed IS journals has also focused on pricing (e.g., Huang et al. (2015), Cheng et al. (2016), and Chen et al. (2021)) and optimization (e.g., Jhang-Li & Chiang (2015) and Guo et al. (2019)). The IS community has also explored the perspective of software vendors when they transition from offering on-premise versions of their products to providing SaaS (e.g., Kaltenecker et al. (2015), Xiao et al. (2020), and Schneckenberg et al. (2021)). While IS scholars have not completely overlooked the socio-technical implications for organizations that adopt cloud services, they narrow their focus to specific aspects such as determining whether to structure the IT department as a cost or profit center in the cloud context (Choudhary & Vithayathil, 2013), or exploring the relationship between SaaS and agility (Khalil & Winkler, 2023). However, this limited scope hinders the development of a comprehensive approach towards cloud transformation. Consequently, this thesis sets out to fill the existing research gap by exploring the broader impact of the technology from a socio-technical perspective. On the one hand, the goal is to spark further academic discourse about this underrepresented topic; on the other hand, the thesis seeks to provide practical guidance for organizations embarking on cloud transformation. Besides technical factors, the thesis explores the effects of cloud adoption on organizational structure, processes, and people-based factors like communication, corporate culture, and the attitude of the workforce towards the cloud, thus providing a holistic view.

3 Research Methods

This chapter details the how I approached the structured literature review (Webster & Watson, 2002) and the multiple case study (Yin, 2014).

3.1 Method of the Literature Review

To address RQ 1 – 2.2, I conducted a literature review, as this research method allows for building a solid foundation in academic projects (Webster & Watson, 2002). In the field of IS, conducting a literature review is typically a complex task considering the extensive and ever-increasing number of articles in diverse outlets like journals and conferences (Vom Brocke et al., 2009). To navigate the review process, I rely on the framework proposed by Vom Brocke et al. (2009) which is widely used in IS research. It consists of five phases, which are depicted in Figure 2. As rigorously documenting the review process is crucial for allowing readers to assess the review's quality (Vom Brocke et al., 2009), I outline how I approached each of the five phases in the following.



Figure 2: Literature Review Process

Source: Own representation, Based on Vom Brocke et al, 2009

Phase 1 – Definition of Review Scope: I set the scope of the literature review using the taxonomy introduced by Cooper (1988), which outlines six attributes (focus, goal, organization, perspective, audience, and coverage) along with their respective categories. Table 1 illustrates this classification, where grey cells highlight the categories chosen for each attribute in my review. In my research, I concentrate on the outcomes of studies and their application in practice, sidestepping an in-depth examination of the methodologies or theoretical frameworks highlighted in the selected articles. The goal of the review is to integrate findings and outline central issues, avoiding a critical review of the chosen publications. The structuring of my literature analysis is guided by the concepts presented rather than the methodologies employed or a historical perspective. My approach to reviewing the literature is unbiased, given the lack of an initial hypothesis. The intended audience for this work includes scholars with an interest in how cloud computing affects organizations and practitioners who can utilize the insights obtained from the review for practical application. Additionally, general scholars can also follow the results of the review, as all the necessary theoretical concepts are explained in the thesis. By drawing on publications in a diverse set of highly reputed outlets in the domains of IS, Management Science, and Computer Science, the literature review covers the subject matter representatively.

Phase 2 – Conceptualization of Topic: Before systematically searching the literature, I started with an initial exploration of fundamental cloud computing concepts like virtualization, service models, and deployment models, drawing on highly cited publications like Armbrust et al. (2009) as well as Mell and Grance (2011). Next, I familiarize myself with review articles about cloud migration like Jamshidi et al. (2013), Zhao and Zhuo (2014), and Gholami et al. (2016). In addition, I considered the cloud adoption frameworks of AWS, Microsoft Az-

ure, and GCP to enrich the knowledge I built from academic sources with a practical perspective. Finally, I consulted a book about cloud strategy by Hohpe (2020), which is well-known among cloud practitioners. At this point, I had established a basic understanding of the subject at hand and was ready to conduct the systematic literature search process.

Characteristic	Categories			
	Research Outcomes	Research Methods	Theories	Applications
Focus	Integration	Criticism		Central Issues
Goal	Historical	Conceptual		Methodological
Organization	Neutral Representation		Espousal of Position	
Perspective	Specialized Scholars		Practitioners	General Public
Audience	Exhaustive	Exhaustive & Selective	Representative	Central/Pivotal
Coverage				

Table 1: Taxonomy of the Literature Review

Source: Own Representation, Based on Cooper (1988) and vom Brocke et al. (2009)

Phase 3 – Literature Search: The literature search process involves selecting outlets and databases, defining keywords, including and excluding articles, and applying a forward and backward search. Figure 3 gives an overview of these steps. To describe the process in detail, I split it into two phases: outlet selection and data collection.



Figure 3: Literature Search Process

Source: Own Representation, Based on Webster & Watson, 2002

Phase 3.1 – Literature Search – Outlet Selection: Webster and Watson (2002) recommend initiating a literature review with an emphasis on leading journals to ensure consideration high-quality articles. In the IS domain, the Association for Information Systems (AIS) Senior Scholars' List of Premier Journals (AIS, 2023) represents a collection of esteemed journals, which I used as a starting point for my research, expecting to find contributions on the socio-technical impact of cloud computing. Moreover, the AIS lists various special interest groups (SIGs), each suggesting additional reputable journals in specific areas of interest (AIS, 2023). I chose two SIGs (Leadership in IT and Cognitive Research) as relevant for exploring the organizational aspects of cloud computing, and thus selected the four additional journals recommended by these two SIGs. As IS research is a discipline that sits between management sciences and computer science, I further included outlets from both fields in the literature review. For the management domain, I chose the FT50 journals (Ormans, 2016), a collection of 50 highly reputed outlets. To cover the computer science perspective, I searched for journals specifically dedicated to cloud computing and found four. I chose to include three in my literature review, as one journal had a low impact factor and cite score. Finally, I included two leading conferences in the field of IS. These are the International Conference on Information Systems and the European Conference on Information Systems.

Phase 3.2 – Literature Search – Data Collection: I queried the previously defined outlet categories (AIS Senior Scholars Premier Journals, AIS SIGs recommended journals, FT50

journals, cloud-specific journals, and leading IS conferences) sequentially. I searched the Premier Journals, AIS SIGs recommended journals, FT50 journals and cloud-specific journals on Scopus, as this database indexes all the journals in question. First, I queried the Premier Journals using *cloud* as the search term within titles, abstracts, and keywords to maintain a broad search scope, avoiding overly restrictive queries that might yield limited results. This approach resulted in 109 articles. Next, I applied the same search parameters to the four journals recommended by the two AIS SIGs previously identified, which yielded 92 hits. Before I searched the FT50 journals, I excluded four journals from this set, as these outlets were already covered by the Premier Journals and the AIS SIGs. Querying the 46 remaining journals resulted 78 publications. For the cloud-specific journals, I used a different search string than *cloud*, as the cloud context was already given in these journals, yielding 211 hits. The respective search string can be found in Table 2. Finally, I queried the two leading IS conferences in the AIS eLibrary, as this platform provides more extensive coverage of these conferences than other databases. Consequently, I deployed a search for cloud in titles, abstracts, and subjects, resulting in 195 hits. Table 2 summarizes the search parameters and number of hits for every outlet category.

Outlet Category	Database	Search String	Scope	Hits
AIS Senior Scholars' Premier Journals	Scopus	cloud	Title, Abstract, Keywords	109
Recommended Journals by Relevant AIS SIGs	Scopus	cloud	Title, Abstract, Keywords	92
FT50 (excl. 4 Journals in AIS Premier Journals and SIGs)	Scopus	cloud	Title, Abstract, Keywords	78
Cloud-Specific Journals	Scopus	migration OR adoption OR transformation	Title, Abstract, Keywords	211
AIS Conferences	AIS eLibrary	cloud	Title, Abstract, Subject	195
Total				685

Table 2: Search Parameters per Outlet Category

Source: Own Representation

In summary, searching (a) the leading IS journals, (b) recommended journals by relevant AIS SIGs, (c) leading management journals, (d) cloud-specific journals, and (e) leading IS conferences yielded 685 articles. I leveraged an iterative approach to analyze this set. First, I screened the titles and abstracts, and discarded publications that clearly do not contribute to the objective of this thesis. For instance, this encompassed articles dealing solely with the technical or financial aspects of cloud computing, examining the perspective of end-consumers, or exploring cloud technology in the context of education. Next, I analyzed the articles for cloud adoption approaches, frameworks, and socio-technical factors like the effect on organizational structures, roles, or processes. When I was in doubt whether to select an article, I skimmed through the entire article, focusing on the introduction, discussion and conclusion. This process resulted in a set of 25 sources. According to Webster and Watson (2002), I applied a forward and backward search that yielded 12 additional articles. Table 3 gives an overview of the results of the inclusion and exclusion process, depicting the number

of search hits and selected articles for each outlet. Note that the table only lists journals that had at least one search hit.

Outlet Category	Outlet	Search Hits	Selected	FW/BW Selected
AIS Senior Scholars' Premier Journals	Decision Support Systems	22	1	-
	European Journal of Information Systems	6	2	-
	Information and Management	17	0	-
	Information and Organization	1	0	-
	Information Systems Journal	5	1	-
	Information Systems Research	16	0	-
	Journal of Information Technology	13	1	-
	Journal of Management Information Systems	14	3	-
	Journal of Strategic Information Systems	5	1	-
	Journal of the Association for Information Systems	3	0	-
Recommended Journals by Relevant AIS SIGs	Management Information Systems Quarterly	7	0	-
	Computers in Human Behavior	44	2	-
	IEEE Transactions on Engineering Management	36	1	-
	Information Technology and People	11	1	-
	Organizational Behavior and Human Decision Processes	1	0	-
	Accounting, Organizations and Society	2	0	-
	American Economic Review	1	0	-
	Entrepreneurship Theory and Practice	1	0	-
	Harvard Business Review	4	1	-
	Human Relations	1	0	-
FT50 (excl. 4 Journals in AIS Premier Journals and SIGs)	Journal of Accounting and Economics	1	0	-
	Journal of Applied Psychology	2	0	-
	Journal of Business Ethics	2	0	-
	Journal of Business Venturing	1	0	-
	Journal of Consumer Psychology	2	0	-
	Journal of Finance	1	0	-
	Journal of Financial Economics	3	0	-
	Journal of Management Studies	2	0	-
	Journal of Marketing Research	2	0	-
	Journal of Operations Management	1	1	-
	Journal of the Academy of Marketing Science	2	0	-
	Management Science	8	0	-
	Manufacturing and Service Operations Management	6	0	-
	Marketing Science	3	0	-
	Operations Research	7	0	-
	Production and Operations Management	13	0	-
	Research Policy	1	0	-
	Review of Accounting Studies	1	0	-
	Review of Finance	1	0	-
	Sloan Management Review	3	0	-
Cloud-Specific Journals	Strategic Entrepreneurship Journal	1	0	-
	Strategic Management Journal	4	0	-
	Organization Science	2	0	-
AIS Conferences	IEEE Transactions on Cloud Computing	110	1	-
	International Journal of Cloud Applications and Computing	25	2	-
Other Outlets	Journal of Cloud Computing	76	1	-
	ECIS	102	2	-
	ICIS	93	4	-
Other Outlets	Other Journals	-	-	10
	Other Conferences	-	-	2
	Non-Academic Sources	-	7	-
Total		685	32	12

Table 3: Outlet Matrix
Source: Own Representation

I also included seven non-academic sources in my literature review. When I familiarized myself with the topic, it became evident that practitioners heavily rely on cloud adoption approaches and frameworks developed by large cloud providers. Consequently, due to the practical focus of my thesis, I decided to include the cloud adoption frameworks of AWS, Microsoft Azure and GCP in the literature review, as these are the market-leading cloud vendors (Statista, 2024a). I also included two blog articles published on AWS' cloud blog, a KPMG report and a book. These sources outline cloud migration approaches which are well-known in practice. In summary, the final set consists of 44 sources. The selected sources were published between 2010 and 2024. They are included in the bibliography and marked with an asterisk. I conducted the literature search in February and updated the number of hits in June 2024.

Phase 4 – Literature Analysis and Synthesis: According to Webster and Watson (2002), I developed a concept matrix to organize and analyze the selected sources (see Appendix A). Guided by the research questions, I analyzed the literature for approaches, success factors, challenges, and best practices. Regarding the approaches, I observed that the sources either describe different types of migration, for example differentiated by the degree of adaption, or outline cloud adoption approaches from a procedural perspective. Thus, I used these two concepts to categorize the approaches in the matrix. As only some articles explicitly mentioned success factors, I did not develop further concepts for this aspect. When reviewing the selected sources for challenges and best practices, I found that most articles do not explicitly mention these aspects as such. Instead, they focus on specific topics from which challenges and best practices can be inferred. Thus, I developed concepts that relate similar topics into broader categories. For instance, I consolidated articles that discussed the effects of cloud computing on roles, responsibilities, or relationships between organizational units into the concept *strategic and organizational implications*. Further, I summarized sources that center around the perception, attitude, or skills of employees into the concept *people-based factors*. Finally, I developed the concept *impact on processes and way of working* to classify articles that discuss aspects like the cloud's impact on agility. These concepts helped me ensure a structured approach to synthesizing the literature.

Phase 5 – Research Agenda: I present a research agenda in Section 7.2.

3.2 Method of the Multiple Case Study

An overview of the process I followed to conduct the case study is depicted in Figure 4. The following sections describe the involved steps in more detail.

3.2.1 Case Study Design

The goal of this thesis is to explore the socio-technical factors that are associated with cloud adoption in organizations. In the real world, such an initiative involves a multitude of stakeholders, tasks, and decisions. To investigate such a complex and context-sensitive setting, I chose a case study as a suitable research method, as it can be applied to study a “contemporary phenomenon (the ‘case’) in its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident” (Yin, 2014).

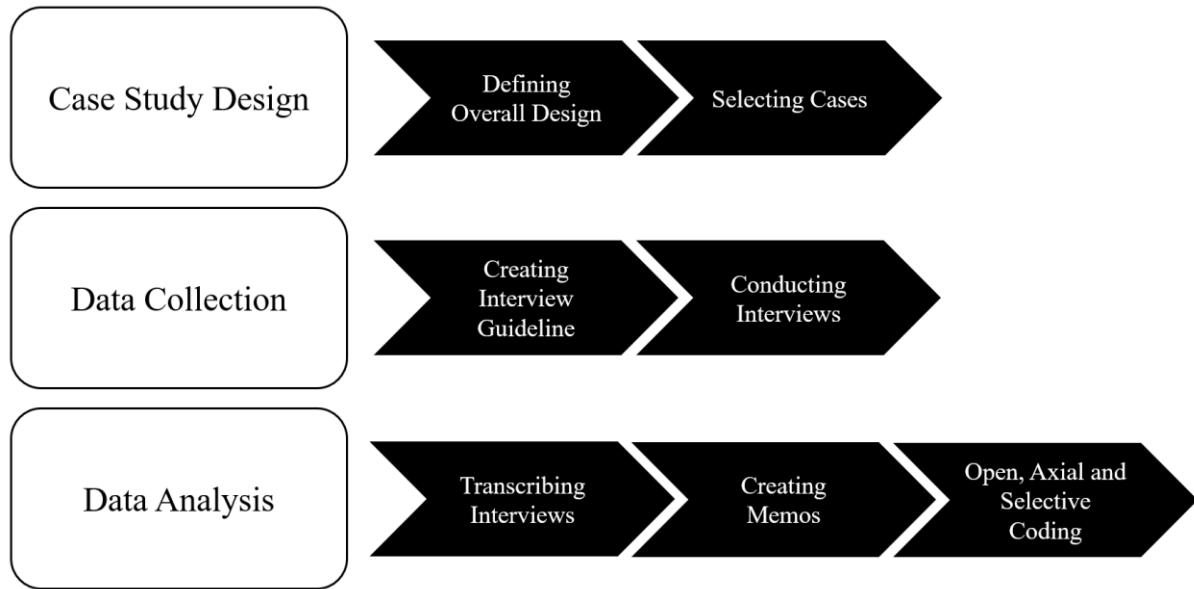


Figure 4: Case Study Process

Source: Own Representation, Based on Yin (2014)

To be precise, I chose a multiple case study design, as it is expected to overall lead to more robust results than a single case study (Yin, 2014). I utilized a holistic over an embedded design, as I did not expect the cloud strategy of a given organization to differ substantially between business units, but rather to be a unified top-down directive from the executive management. The goal of the multiple case study is neither to describe a specific phenomenon in detail, nor to explain causal relationships, but rather to unveil the socio-technical effects of cloud adoption on organizations. Thus, the case study is exploratory in nature. Table 4 gives an overview of the case study design. Grey cells highlight the chosen categories.

Characteristic	Categories		
Overall Design	Single Case Study	Multiple Case Study	
Unit of Analysis	Holistic	Embedded	
Purpose	Descriptive	Explanatory	Exploratory

Table 4: Case Study Design

Source: Own Representation, Based on Yin (2014)

I selected three cases to investigate the socio-technical impact of cloud adoption in organizations. As I expected contrasting results for foreseeable reasons due to the surrounding setting of the cases, I employed a theoretical replication logic (Yin, 2014). By selecting organizations that are either undergoing a cloud transformation or a large cloud migration for at least three years, I ensured similarity across the cases. Nevertheless, I assumed that the socio-technical challenges faced by the organizations and the best practices they employ would vary based on two factors: a) the industry sector in which the organizations operate, along with the associated core competencies, and b) their expertise in IT and software. I presume that the industry sector influences cloud adoption. For example, an organization operating in a strictly regulated sector may face different or additional challenges compared to one in a less regulated envi-

ronment. In addition, an organization operating in a sector that traditionally relies heavily on on-premise data centers (e.g., because latency must be avoided) may be posed with other challenges than companies that have no sector-specific requirements that favor on-site infrastructure. Further, I argue that b) an organization's expertise in IT and software influences the integration of cloud services, as such endeavors are typically complex tasks in large organizations. Given their greater experience in other IT projects, organizations with high IT capabilities might experience fewer challenges and employ different best practices compared to organizations whose core business is not related to IT and software.

In total, I selected three organizations for the multiple case study: MediaCorp, InsuCorp, and SoftwareCorp. I expected MediaCorp, currently undergoing a cloud transformation (E4: 35; E11: 14; E14: 32; Archival Source 1, 2024), to represent a 'traditional' example of an organization embarking on cloud services for two reasons. First, the media and entertainment sector in which MediaCorp operates is not subject to stringent regulation. Second, the firm's core competency does not lie in IT or software, but rather in the production of entertainment content. Similar to MediaCorp, InsuCorp is also undergoing a cloud transformation (Archival Source 6, 2021), with its core business situated outside of IT and software. However, unlike MediaCorp, the company is operating in the finance and insurance sector, an environment that is subject to stringent regulation. Finally, SoftwareCorp exemplifies a company with substantial expertise in IT and software, setting it apart from the first two cases. Its core competency lies in developing enterprise software. SoftwareCorp itself operates as cloud provider in the market, offering many of its solutions as cloud versions. While the company does not claim to be undergoing a cloud transformation, it is increasingly favoring cloud-based solutions over on-premise options, both for its market offerings and internal use (E7: 23; E8: 23, 25; E20: 23). I investigate the integration of ServiceNow at MediaCorp, a large cloud migration project that has started in 2019 (E20: 17). Table 5 provides an overview of the three cases.

Pseudonymized Company Name	Industry Sector	Core Expertise	Subject to Stringent Regulation?	Type of Examined Cloud Adoption
MediaCorp	Media and Entertainment	Production of Entertainment Content	No	Cloud Transformation
InsuCorp	Insurance and Finance	Providing Insurance and Financial Services	Yes	Cloud Transformation
SoftwareCorp	IT and Software	Developing Enterprise Software	No	Large Cloud Migration (ServiceNow Integration)

Table 5: Overview of Selected Cases

Source: Own Representation

3.2.2 Data Collection

Leveraging multiple sources of evidence and triangulating data allowed me to ensure construct validity (Yin, 2014). In total, I conducted 20 semi-structured, in-depth interviews with cloud experts from practice (Myers & Newman, 2007). I conducted 14 of these interviews across the three organizations. The remaining six interviews are excluded from the multiple case study for two reasons: it was either not possible to find additional interview partners within the respective organizations, or it turned out that the organizations were still in the planning phase of the cloud adoption and had not yet started the implementation phase. Still,

Section 6.4 describes selected aspects from these interviews that enrich the analysis of three organizations that are part of the multiple case study. The duration of the recorded audio material is 14 hours and 45 minutes, averaging 44 minutes per interview. The shortest interview was 30 minutes, while the longest lasted 56 minutes. I held all interviews online using Microsoft Teams and Google Meet. In addition to the interviews, I collected archival data such as magazine articles, presentations, and blog posts. Table 6 gives an overview of the cases and interviews.

Pseudonymized Company Name	Industry Sector	Type of Examined Cloud Adoption	Number of Archival Sources	Interview Partner	Position	Interview Duration
MediaCorp	Media and Entertainment	Cloud Transformation	5	Expert 4	Senior Vice President IT Infrastructure	56 min
				Expert 9	Head of Datacenter and Cloud Solutions	40 min
				Expert 11	CEO of Enterprise IT Subsidiary	45 min
				Expert 12	Head of Data Platforms	43 min
				Expert 14	Vice President Corporate Holding Solutions	46 min
				Expert 15	Cloud Architect	35 min
				Expert 19	Head of Platform Engineering and Operations	45 min
InsuCorp	Insurance and Finance	Cloud Transformation	3	Expert 5	Global Head of Data Management Platforms	48 min
				Expert 13	Software Architect	53 min
				Expert 17	IT Service Manager	44 min
SoftwareCorp	IT and Software	Large Cloud Migration (ServiceNow Integration)	–	Expert 7	Head of IT Service Management Development	51 min
				Expert 8	IT Manager	49 min
				Expert 18	Head of IT Service Management	44 min
				Expert 20	Senior ServiceNow Platform Architect	49 min
Other Organization #1	Aerospace	–	–	Expert 1	Senior Manager Cloud Services	41 min
Other Organization #2	IT and Software	–	–	Expert 2	Head of Cloud Development	44 min
Other Organization #3	IT and Software	–	–	Expert 3	Head of Cloud Engineering	45 min
Other Organization #4	IT and Software	–	–	Expert 6	Senior Consultant Digital Transformation	30 min
Other Organization #5	Public Administration	–	–	Expert 10	Senior IT Architect	41 min
				Expert 16	Senior IT Consultant	36 min

Table 6: Overview of Cases and Interviews

Source: Own Representation

In qualitative research, different types of interviews exist, for example structured interviews, i.e., interviews with a fully prepared set of questions, or semi-structured interviews, in which the script is incomplete, and improvisation is necessary (Fontana & Frey, 2000; Myers & Newman, 2007). I utilized the semi-structured approach, as it allows for reacting to specific information provided by the interviewee, for instance to deepen the questions on a certain challenge an interviewee mentions. Consequently, I created a semi-structured interview guideline consisting of three phases (see Appendix B). The first phase contains questions about the professional background of the interviewee, such as the current role and how long he or she is working in this role. The second phase represents the main part of the interview and is organized in six blocks. The first block investigates the organization's cloud strategy, including its objectives, scope, progress, and the strategic challenges associated with it. The second block contains questions about the impact of cloud adoption on the organization's core business processes, detailing which divisions are most affected and how it influences end users' work. The third block deals with factors such as corporate culture, communication, and the workforce's attitude towards cloud adoption. The fourth block investigates the impact of cloud integration on organizational structure. For example, it examines whether new teams were formed, or which role external partners play. The fifth block focuses on the migration process itself, asking experts whether they use a specific framework for migration projects and how they track progress, for instance. The final block of the main phase addresses technical aspects, such as whether companies have reduced their in-house data centers due to cloud adoption and what typical technical hurdles occur in migration projects. After this main phase, the final phase concludes the interview by giving the interviewee a chance to share

anything that has not been discussed, asking for further contacts and archival data, and thanking the interviewee. When the interview was finished early, I addressed additional questions that emerged either during the interview process or in my preparatory phase but remained unanswered within the main interview timeframe. The interview guideline was intentionally designed to include more questions than could be covered in a 45-minute session. This approach allowed me to adjust the interview process considering the diverse backgrounds of the interviewees, their roles, and areas of expertise. Some of the archival data was provided by the interview partners, while I found other data online in a magazine, on the blogsite of one of the three organizations, and on the website of a cloud provider. Consequently, I maintained a chain of evidence and a case database contained in the digital submission of this thesis (Yin, 2014).

3.2.3 Data Analysis

After each interview took place, I created a pseudonymized transcription. Following this procedure, I created a memo that served as a summary of important aspects of the interview, such as challenges and best practices the respective expert explicitly mentioned (see Appendix C). In addition, the memos capture background information about the expert, such as his job title. The memos allowed me to prepare for the next interview in the respective organization, for example by identifying topics that I wanted to investigate further with the next interview partner. Subsequently, I analyzed the transcripts utilizing the grounded theory coding process (Glaser & Strauss, 1967). Starting with open coding, I read through the interviews and developed first-order concepts that describe the respective text segments. I often designed the codes as short sentences and phrases instead of single words to make them more descriptive. As a next step, I performed axial coding to create second-order themes that relate similar open codes. Finally, I applied selective coding to form aggregate dimensions that group related second-order themes. Appendix D provides a full list of axial and selective codes along with examples of open codes. In total, I developed 1153 unique open codes that are assigned to 1512 text segments. Further, I formed 18 axial and six selective codes. While the grounded theory coding process is inductive in nature, I followed an abductive approach (Timmermans & Tavory, 2012). The literature review I performed previously provided me with a rough deductive framework of topics to analyze. Still, I coded the interview data open towards new concepts in an inductive manner. This combination of induction and deduction enabled me to find new concepts on the one hand and known ones on the other. I performed the coding with the tool MAXQDA. While I held and transcribed all interviews in German, I created the codes in English. For the analysis in Chapter 6, I translated quotes of interviewees into English.

4 Cloud Adoption Approaches

This chapter examines RQ 1: *What approaches can organizations employ to adopt cloud services?* through the structured literature review, supported by non-academic sources that are well-known among cloud practitioners.

4.1 Types of Cloud Migration Approaches

Cloud migration approaches can be classified by the involved application layers, the extent to which the respective system is adapted, and the targeted service models.

When differentiating by the affected application layers and the degree of adaption, four migration types can be defined: *replace*, *partially migrate*, *migrate the whole stack*, and *cloudify* (Jamshidi et al., 2013). In the first type, replace, either the data layer or the business logic layer or both of an existing on-premise application is migrated to a cloud environment, yet not the presentation layer (Jamshidi et al., 2013). This type requires reconfiguration to tackle incompatibilities, yet no need to substantially rearchitect the application (Jamshidi et al., 2013). Partially migrating refers to adapting a subset of functionalities or components of a given system to the cloud, while others remain on-premise (Jamshidi et al., 2013). The third type, migrate the whole stack, requires no adaption, as all three application layers are shifted to a cloud infrastructure in a monolithic fashion without any modification (Jamshidi et al., 2013). The last type, cloudify, refers to modifying an entire system with all of its three layers into a fully cloud-enabled application, requiring adaption of associated processes, services and infrastructure (Jamshidi et al., 2013). This classification can help practitioners during the planning phase of a migration project by assessing the complexity and the effort required for the migration.

When considering the service models targeted and the extent of reengineering required, cloud migrations can be categorized into five types. The first type involves deploying the business logic layer of an application to a cloud infrastructure using an IaaS model, while the data layer stays in an organization's on-premise datacenter (Gholami et al., 2016). The second type involves replacing either the entire application or a subset of its components with a SaaS solution (Gholami et al., 2016). The third method is about moving a legacy database to a cloud environment utilizing the IaaS service model (Gholami et al., 2016). In contrast to the first type, the business layer is kept on-premise. The fourth type involves adapting the data layer to migrate it to a cloud database system (Gholami et al., 2016). Compared to the third type, this approach encompasses modifying the data to leverage a cloud database instead of a cloud storage service (Gholami et al., 2016). The last method encapsulates deploying the entire system stack to a virtual machine in the cloud using IaaS (Gholami et al., 2016). Each of these migration types represents varying levels of complexity and adaptation. The choice of migration type typically depends on the nature of the legacy application and the desired cloud service model (Gholami et al., 2016). To summarize, this categorization can aid professionals to choose the appropriate service model for the system to be migrated.

A similar classification of migration approaches is provided in a literature review on cloud migration by Zhao and Zhuo (2014), differentiating migration strategies based on the underly-

ing service model and the degree of adaption. They identified five migration strategies: *migrate to IaaS*, *migrate to PaaS*, *replace by SaaS*, *revise based on SaaS*, and *reengineer to SaaS*. When migrating to IaaS, an existing legacy application is simply moved to cloud infrastructure (Zhao & Zhou, 2014). While this strategy is straightforward to implement, it does not take advantage of the cloud's benefits. In contrast, when migrating to PaaS, the application needs to be refactored to work on the respective cloud platform (Zhao & Zhou, 2014). While this adaption can leverage the benefits of the cloud, it is more complex and entails a higher workload than the first strategy (Zhao & Zhou, 2014). Migration that involves SaaS can be categorized into three strategies. Replacing by SaaS represents discarding the entire legacy application and using a SaaS solution instead (Zhao & Zhou, 2014). This approach requires no adaption and thus is associated with only little workload and complexity (Zhao & Zhou, 2014). When revising based on SaaS, only a subset of the features the legacy app provides are replaced by a SaaS solution (Zhao & Zhou, 2014). Consequently, this approach is of moderate complexity and workload, as it requires slight adjustments (Zhao & Zhou, 2014). The last strategy involves completely reengineering a legacy application to a SaaS solution (Zhao & Zhou, 2014). This approach entails the highest complexity and workload, as it may require redesigning or reverse engineering the entire application (Zhao & Zhou, 2014). In summary, each strategy has its own advantages. Migrating to IaaS allows organizations to save hardware costs, migrating to PaaS removes the need to manage resources, and the approaches that involve SaaS migration offer flexibility in pricing and straightforward maintenance (Zhao & Zhou, 2014).

In practice, a widely used classification of cloud migration approaches are the so-called six R's. The differentiating factor in this classification is the extent to which the system to be migrated is adapted to the cloud. The R's stem from practice rather than from academia. In 2010, Gartner came up with the following five migration approaches: Rehost, Revise, Re-architect, Rebuild, and Replace (Watson, 2010). In 2018, they renamed Re-architect to Refactor (Hohpe, 2020). AWS has coined a similar yet different set of R's in 2016, consisting of Re-host, Replatform, Repurchase, Refactor (also called Re-architect), Retire, and Retain (Orban, 2016). I describe the six R's in the sense of AWS based on Orban (2016) and Allen (2021) in the following.

Refactor/ Re-architect: This relates to redesigning the architecture of the system when moving to the cloud. In contrast to rehosting, this method changes the core of the existing solution. Often, the motivation for this approach originates from a business need. This can involve pursuing new functionality or better performance, for example.

Replatform: This method involves slight adjustments of the existing application without substantially modifying its underlying architecture. For instance, the need to optimize the applications for the cloud can stem from licensing restrictions or outdated operating system not supported in the new environment (Hohpe, 2020).

Rehost: This approach towards cloud migration is also known as lift-and-shift. This method migrates applications, services, or data to a cloud environment as they are. Basically, there is no effort put in to adjust the structure of the entities to be migrated. This approach is especial-

ly popular among organizations when complex legacy systems are moved to the cloud. Cloud vendors provide tools that assist in automating this migration type.

Repurchase: This approach replaces the existing on-premise solution with an alternative offer, typically a SaaS solution.

Retire: In this approach, the existing solution is simply discarded. In contrast to repurchasing, the system is not replaced by another product.

Retain: In this approach, an organization decides to do nothing about the existing application, for example because there currently is no strong business need to do so. A different decision may be made at a later point in time.

To summarize, these approaches vary in their complexity and effort. Retain and Retire are the least demanding, while Repurchase and Rehost involve moderate efforts. Replatform requires further adjustments for optimization the system to the cloud, while Re-architect represents the most effort-intensive method, demanding core architectural changes to fully leverage cloud capabilities. Note that Rehost can also be combined with Refactor or Replatform. First, the respective application can be moved to a cloud environment using a Rehost, and afterwards a Refactor or Replatform can be applied. Overall, this straightforward classification assists cloud professionals in choosing the suitable approach for their migration projects.

4.2 Procedural Cloud Adoption Approaches

Academia has provided several process models for cloud adoption, differing in granularity and scope.

From a high-level process perspective, cloud migrations can be organized into the *migration planning*, *migration execution* and *migration evaluation* process, governed by the *cross-cutting concerns* process (Jamshidi et al., 2013). The migration planning process involves analyzing the feasibility and requirements of the migration, and the selection of the cloud vendor and the systems to be migrated, and the services to employ (Jamshidi et al., 2013). During the migration execution, the technical migration is carried out, which involves extracting data and modifying code, and adapt the underlying architecture of a system, for instance (Jamshidi et al., 2013). Afterwards, the system is tested, validated, and deployed in the migration evaluation process (Jamshidi et al., 2013). The cross-cutting concerns phase is carried out in parallel to each of the three aforementioned steps and involves tasks that support the overall migration process, such as governance, security analysis, training, and effort estimation (Jamshidi et al., 2013). This high-level procedural framework for cloud migrations can aid practitioners in structuring their migration initiatives.

When considering not only the act of migrating systems, but also the characteristics of the organization, the cloud provider, and the application, a process of nine steps can be outlined. First, an organizational profile needs to be defined that captures characteristics such as legal or administrative constraints, which may influence cloud adoption decision (Beserra et al., 2012). Next, this profile can be evaluated to identify potential constraints that could impede cloud adoption, such as resistance to change or legal restrictions (Beserra et al., 2012). If no

constraints impede the migration, profiles for both the application and cloud providers need to be defined (Beserra et al., 2012). The application profile details technical and usage-related characteristics of the legacy application to be migrated, while the cloud provider profiles help to evaluate potential vendors and their respective offerings regarding resources, costs, and support, for example (Beserra et al., 2012). Based on these profiles, technical and financial restrictions should be analyzed next (Beserra et al., 2012). When facing restrictions regarding the application, either the application needs to be modified or the scope of the migration needs to be adjusted (Beserra et al., 2012). If restrictions regarding the cloud provider have been identified, alternative vendors must be considered, whose offerings may better align with the organization's needs (Beserra et al., 2012). When there are no more constraints, a migration strategy needs to be developed that considers the identified aspects of the previous steps (Beserra et al., 2012). Finally, the migration can be performed. In summary, this process provides a holistic approach towards cloud migrations by not only considering the application to be migrated, but also the characteristics of the organization and cloud providers.

Organizations that are at the beginning of their cloud journey can take a structured approach by identifying legal restrictions relevant to their cloud usage, experimenting with SaaS, developing a first project in a cloud environment, and engaging with key software providers to understand their cloud strategies. At the outset, it is crucial to identify legal and regulatory constraints to be able to assess whether a reluctant or enthusiastic approach towards cloud adoption is appropriate, considering sensitive data, for instance (McAfee, 2011). The next step is to experiment with SaaS offerings to determine whether to further adopt cloud solutions (McAfee, 2011). This involves using control groups and collecting data to measure impacts on IT costs, employee satisfaction, and business outcomes (McAfee, 2011). After gaining experience with SaaS, organizations can utilize IaaS and PaaS for an initial software development project in the cloud, as these service models allow developers to focus on coding and abstract from the complexity of setting up and maintaining the environment (McAfee, 2011). In addition, cloud environments offer tools and services such as Google Maps, which developers can easily integrate in cloud projects to leverage their functionalities (McAfee, 2011). Finally, organizations can communicate with their key software vendors to understand their future cloud strategies, offerings, and migration support options (McAfee, 2011). This incremental approach serves as a valuable guideline for organizations that are embarking on cloud adoption.

While not focusing on the migration process itself, a holistic cloud migration framework was developed by Khajeh-Hosseini et al. (2012), aiming to assist organizations in the decision-making process. I describe this framework briefly in the following. It encompasses technology suitability analysis, cost modeling, energy consumption analysis, stakeholder impact analysis, and responsibility modeling. As a first step, the technology suitability analysis helps organizations assess whether cloud computing is an appropriate technological fit for their specific systems. It involves a checklist that evaluates the cloud's ability to meet organizational needs. On the one hand, this encompasses technical aspects like scalability, bandwidth, and latency. On the other hand, the checklist also covers considerations related to security, privacy, and regulation. The next step, cost modeling, aims at determining the cost of operating cloud infrastructure. It provides cost transparency to support decision makers and helps technical staff to assess the operational expenses of the potential cloud system. Energy consump-

tion analysis aims to assess implications of moving to a cloud-based infrastructure by balancing the economic trade-off between performance and energy consumption. In parallel to cost modeling and energy consumption analysis, organizations can perform a stakeholder impact analysis that examines how the migration affects various stakeholders. This step involves assessing effects on employees' tasks, job satisfaction, and the perception of the cloud adoption. Finally, responsibility modeling allows analyzing the operational viability of the migration by identifying the associated tasks like development, operation, and maintenance, and how these responsibilities are distributed across different stakeholders. To summarize, this framework helps organizations to make informed decisions about cloud adoption, taking into account technological feasibility, costs, energy consumption and the affected stakeholders and their responsibilities.

4.3 Cloud Adoption Frameworks by Hyperscalers

Hyperscalers like AWS, Microsoft Azure and GCP provide cloud adoption frameworks for their respective platforms. While these frameworks are not academic sources, they are highly relevant in practice. As this thesis sets out to not only enrich scholarly research but also to provide valuable insights for practitioners, this section briefly touches upon the frameworks of the three leading providers in the cloud computing market (Statista, 2024a).

AWS Cloud Adoption Framework

The AWS Cloud Adoption Framework encompasses six perspectives: business, people, governance, platform, security, and operations. I describe these briefly based on the framework's whitepaper (AWS, 2021) in the following. The business perspective aims to ensure that an organization's cloud strategy aligns with its business goals and supports its digital transformation. Organizational changes, training, and fostering a culture of continuous learning are covered by the people perspective. The governance perspective aims to establish clear policies and management practices to align the cloud adoption with business requirements. The platform perspective involves technical aspects such as the design, implementation, and optimization of cloud infrastructure. The goal of the security perspective is to ensure that the cloud environment adheres to required security standards and best practices to protect data and applications. Finally, the operations perspective assists organizations to enhance the management and monitoring of cloud resources to ensure efficient and reliable operations. Overall, this framework is designed to assist practitioners in their cloud initiatives by providing a holistic view besides solely technical factors.

Microsoft Cloud Adoption Framework for Azure

The Cloud Adoption Framework for Azure is designed to support organizations through the various stages of their cloud adoption journey, from initial planning to ongoing management. I outline its phases in the following based on the framework's documentation (Microsoft, 2024). The initial phase, *Strategy*, involves defining motivations and desired business outcomes. These considerations help organizations align their cloud adoption strategy with their business objectives. The second phase, *Plan*, focuses on aligning actionable adoption plans to the business outcomes identified in the strategy phase. It includes creating a cloud adoption plan, identifying required resources, and preparing the existing systems for the migrations.

The *Ready* phase encompasses preparing the environment for the planned changes. It includes setting up the Azure environment and ensuring that it meets the organization's requirements. Existing on-premise applications are moved to cloud environments in the *Migrate* phase. In contrast, the *Innovate* phase represents developing new cloud-native applications. While these phases typically are carried out after another, three additional phases surround the process from the beginning on. The *Secure* phase is about protecting the organization's assets, identifying potential risks, and developing resilience. The *Manage* phase encompasses operational management and continuous improvement, including the monitoring cloud resources, and optimizing performance as well as costs for ongoing cloud operations. The *Govern* phase involves implementing governance directives that ensure the deployed solutions are reliable, secure, compliant, and can be managed cost-effectively. In summary, this cloud adoption framework helps organizations to structure their cloud adoption efforts.

Google Cloud Adoption Framework

The Google Cloud Adoption Framework focuses on four themes that are vital for a successful cloud transformation: Learn, Lead, Scale, and Secure. I describe these briefly based on the framework's whitepaper (Google, 2024). The first theme emphasizes the importance of education and upskilling within the organization. It involves developing the capabilities necessary for the adoption via training programs and continuous learning opportunities. The Lead theme involves setting a clear vision and supportive management practices that encourage the transition to the cloud. This includes backing by executives, fostering a culture of innovation, and ensuring that teams cooperate in a cross-functional and collaborative way. The ability to expand and optimize cloud operations efficiently is addressed by the Scale theme. It encompasses adopting cloud-native services that reduce operational overhead and enable automation of manual processes. In addition to these four themes, Google defines three maturity phases (tactical, strategic and transformational) that help organizations to assess their current status regarding each of the four themes. To summarize, Google's framework sets out to create awareness among organizations for learning, leadership, scalability and security to assess and increase their cloud readiness.

4.4 Discussion

The literature review on cloud adoption approaches reveals that academia fails to provide practitioners with a comprehensive cloud transformation framework. Most of the analyzed articles focus on the migration of a single system. While many articles and even reviews on cloud migration exist, not a single article is specifically dedicated to the broader concept of cloud transformation approaches. Even though the chosen articles contain several reviews, thus covering a large amount of literature, strategic approaches like cloud-first, which are relevant for organizations in practice, are not discussed in these papers. The results of the multiple case study in Chapter 6 support this notion, as only one out of twenty cloud practitioners stated that his company relied on academic research during a phase of their cloud transformation process. In contrast to academia, large cloud providers like AWS, Microsoft, and Google have developed holistic cloud adoption frameworks for their respective platforms. This gap underscores the importance of the goal of this thesis, which is to identify socio-technical factors that organizations should consider during their journey towards the cloud.

5 Socio-Technical Factors of Cloud Adoption – Insights From Theory

This chapter investigates RQ 2.1: *What socio-technical factors influence the success of cloud adoption in organizations?* and RQ 2.2: *What are the challenges and best practices associated with cloud adoption?* from a theoretical point of view by presenting the results of the literature review.

5.1 Socio-Technical Success Factors

Socio-technical success factors of cloud adoption encompass capabilities of IT managers, commitment of leaders, the relationship between the adopting organization and the cloud provider, and upskilling the workforce.

Capabilities of IT managers represent a driver for successful cloud adoption. These capabilities encompass the understanding of the existing system landscape to assess the implications of cloud service integration, the ability to coordinate cloud projects, and leadership abilities (Garrison et al., 2012; Garrison et al., 2015). Skilled IT managers are able to assess the potential of cloud services to support an organization's business objectives, for example to increase performance or reduce IT expenses (Garrison et al., 2012; Garrison et al., 2015).

Further, commitment of organizational leaders is a success factor for cloud adoption. The dedication of top management towards cloud initiatives is essential to stress the importance of the adoption (Raut et al., 2017). Thus, leaders need to communicate the cloud's added value to the workforce (Raut et al., 2017). Further, the commitment of the top management is necessary to ensure the required resources for the cloud adoption are provided (Raut et al., 2017).

The relationship between the organization adopting cloud services and the cloud provider is also crucial for a successful cloud integration. Organizations and cloud providers need to develop a trust-based relationship that facilitates open communication, fair negotiations, and mutual understanding of goals and expectations (Garrison et al., 2012). Such a relationship assists organizations to utilize more tailored and responsive cloud services, enabling them to leverage cloud resources more effectively (Garrison et al., 2012). Further, such a relationship minimizes potential conflicts but also enhances cooperation, leading to improved service delivery and satisfaction (Garrison et al., 2015).

Providing adequate training and knowledge to employees about cloud computing ensures that the workforce is prepared and can leverage cloud services effectively. When organizations integrate cloud services, they need to educate their workforce about the new technology to equip them with the necessary knowledge for future cloud projects (Raut et al., 2017). Training can mitigate employees' concerns about the cloud and foster their understanding of the associated benefits and challenges (Raut et al., 2017).

Table 7 summarizes the identified socio-technical success factors.

Socio-Technical Success Factors of Cloud Adoption
<ul style="list-style-type: none"> • Capabilities of IT Managers • Commitment of Organizational Leaders Towards Cloud Adoption • Establishing a Relationship of Trust With Cloud Provider • Upskilling Workforce

Table 7: Socio-Technical Success Factors of Cloud Adoption

Source: Own Representation

5.2 Socio-Technical Challenges and Best Practices

Socio-technical challenges and best practices associated with the adoption of cloud computing along the categories developed for the concept matrix: strategic and organizational implications, impact on processes and ways of working, and people-based factors.

Strategic and Organizational Implications

The adoption of cloud computing can disrupt the roles, responsibilities, and structure of traditional IT departments, and can cause a shift in decision-making processes between IT and business units. Organizations need to recognize the increasingly strategic role of IT units and foster business understanding among IT experts to overcome such challenges.

The integration of cloud services within organizations alters the role of traditional in-house IT departments. In organizations that do not utilize cloud services, the in-house IT department is the sole provider of IT services to internal consumers, effectively holding a monopoly-like status (Vithayathil, 2018). However, with the integration of cloud services, the cloud provider emerges as an additional entity. In this new setting, internal units have the option to either consume IT services traditionally from the in-house IT department or directly from the cloud provider (Vithayathil, 2018). Furthermore, the IT department itself can procure IT services from the cloud provider (Vithayathil, 2018). This changed dynamic is illustrated in Figure 5. This new setting necessitates a transformation of roles and functions within organizations. The traditional tasks of IT departments, centered on maintaining on-premise IT infrastructure, are increasingly being replaced by strategic responsibilities such as managing cloud-based services and ensuring these services align with business goals (Khalil & Winkler, 2023; Sarkar & Young, 2011; Vithayathil, 2018). Further, traditional IT units need to develop an understanding of the business requirements of internal consumers (Vithayathil, 2018). This shift also introduces new governance challenges that IT departments must navigate, including the management of vendor relationships, data security, and compliance with regulation (Vithayathil, 2018). To summarize, the integration of cloud services shifts traditional technical and operational IT roles and responsibilities towards a more strategic focus.

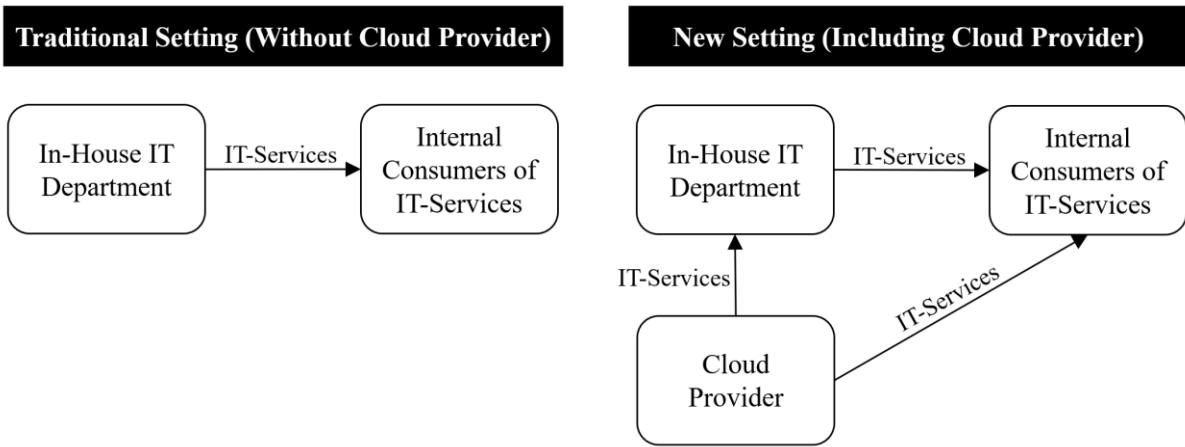


Figure 5: Relationship Between In-House IT Department, Internal Consumers, and Cloud Provider

Source: Own Representation, Based on Vithayathil (2018)

The adoption of cloud services not only changes the roles and responsibilities of an in-house IT department, but can also influence the decision whether to organize this unit as a cost or profit center. Typically, IT departments are organized as costs centers, as they support other organizational units to generate revenue (Choudhary & Vithayathil, 2013). However, when an organization integrates cloud services, it may benefit from reevaluating this decision based on the competitive environment of the cloud vendor. Intense competition among cloud vendors typically leads to lower service costs and commoditization of basic IT services such as storage and computing (Choudhary & Vithayathil, 2013). Under such conditions, organizing an IT department as a cost center can be advantageous, as this structure avoids the complexities and inefficiencies of internal chargebacks while providing essential IT resources across the company without direct cost to the consuming departments (Choudhary & Vithayathil, 2013). Thus, the cost center model effectively leverages the competitive pricing offered by vendors, fostering operational efficiency without the burden of profit generation. In contrast, when cloud vendors possess significant pricing power due to limited competition or highly differentiated services, a profit center model for the IT department may be more beneficial (Choudhary & Vithayathil, 2013). This setting allows IT departments to justify the higher costs of specialized services through value-added activities such as customization and integration tailored to specific business needs (Choudhary & Vithayathil, 2013). The profit center structure not only covers the higher costs but also promotes a revenue-generating unit within the firm (Choudhary & Vithayathil, 2013). In summary, this setup can aid in aligning the IT department's objectives with the organization's business goals.

The integration of SaaS solutions can influence application governance as well as decision rights between IT and business units. Whether an application integration initiative originates from business or IT units often dictates the post-implementation governance (Winkler & Brown, 2013). When business units lead the initiative, they are more likely to retain control over future decisions regarding the application (Winkler & Brown, 2013). In contrast, IT-driven initiatives often retain governance within IT units, which can better manage the technical aspects and enterprise-wide considerations of the application (Winkler & Brown, 2013). The scope and specificity of an application also play a role in determining its governance. Applications with a broad scope of use across, for example across the entire organization,

tend to be governed centrally by IT units (Winkler & Brown, 2013). Highly specific applications, tailored closely to business needs, are often governed by business units (Winkler & Brown, 2013). In the context of SaaS applications, the cloud provider manages the underlying infrastructure, requiring less technical involvement of the in-house IT units. Thus, the integration of SaaS tends to shift decision rights from IT to business units (Winkler & Brown, 2013). While this scenario reduces the need for extensive IT understanding of business units, it increases the importance of business understanding among IT units (Winkler & Brown, 2013). These dynamics highlight the need for organizations to be aware of the impact of SaaS adoption on application governance.

Impact on Processes and Way of Working

While cloud services can foster agility, self-organized teams, and dynamic capabilities, their adoption may also introduce inertia, necessitate cultural shifts within development teams, and require new skills.

Adopting cloud services can, on the one hand, increase agility, but on the other hand, induce inertia among units. Cloud technology allows business units to implement solutions rapidly and source applications independent of the internal IT department, fostering experimentation with different approaches and self-organization (Khalil & Winkler, 2023; Krancher et al., 2018). Consequently, cloud services empower organizations to respond quicker to market changes, enhancing their competitive edge (Khalil & Winkler, 2023). However, this increased agility comes with the challenge of skepticism from IT staff, as they are resistant to change established routines or fear job loss, which may result in inertia among these units (Khalil & Winkler, 2023). Integrating IT units into the cloud adoption process and offering training can mitigate resistance to ensure that the agility gained by cloud integration is not undermined by internal barriers (Khalil & Winkler, 2023). Overall, leveraging the cloud to increase organizational agility requires balancing the technical benefits with proactive management of skepticism.

Leveraging PaaS can enhance the agility and efficiency of software development teams by enabling self-organization and continuous feedback. The potentials of cloud platforms allow software developers to manage their environments independently and make quick adjustments based on real-time insights, thus reducing reliance on support from traditional IT infrastructure units (Krancher et al., 2018). The ability to self-organize fosters autonomy within teams, encouraging faster decision-making and rapid iteration cycles (Krancher et al., 2018). Moreover, cloud platforms support continuous feedback, both internally within the team and externally from customers, which facilitates learning from mistakes and refining requirements (Krancher et al., 2018). However, there are also challenges developers face when utilizing PaaS. To illustrate, while this service model allows them to control infrastructure resources, they often lack the knowledge of how to manage these resources (Krancher et al., 2018). Further, the transition from separate roles in infrastructure management and development represents a cultural change, which can take time to adapt to (Krancher et al., 2018). Overall, the PaaS service model supports the transformation of software development, fostering agility, autonomy and feedback.

Cloud computing can increase an organization's dynamic capabilities, fostering adaptability to evolving market demands. Dynamic capabilities are defined as a firm's "ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516). Cloud computing enables organizations to achieve this ability through four mechanisms. By enabling the dynamic commitment of resources, cloud computing allows organizations to scale their IT infrastructure up or down based on real-time needs (Battleson et al., 2016). The modular design of cloud-based services facilitates the rapid reconfiguration of business processes, which enables companies to tailor their operations to meet evolving customer demands (Battleson et al., 2016). Furthermore, cloud computing supports learning processes within organizations by providing advanced analytics tools that help understand and predict market trends and customer behavior (Battleson et al., 2016). Additionally, the context-specific governance mechanisms offered by cloud services allow companies to control decision-making processes across the organization (Battleson et al., 2016). These capabilities allow organizations to redesign their processes and scope to strive for improved performance (Battleson et al., 2016). However, organizations need to overcome challenges such as security and privacy concerns, network dependency, and a lack of necessary IT skills to fully realize the benefits of cloud-based dynamic capabilities (Battleson et al., 2016). Overall, cloud computing can serve as an enabler of organizational agility and transformation in a rapidly changing business settings.

People-Based Factors

People based factors of cloud adoption encompass employees' attitude towards the cloud, users' readiness and digital literacy.

Resistance among IT professionals towards embracing cloud computing represents a barrier in organizations. Often, these individuals possess extensive experience with on-premise systems and may have skepticism towards new technologies like cloud computing (Khalil & Winkler, 2023; McAfee, 2011). General concerns encompass security, reliability, costs, and regulation (McAfee, 2011), while resistance among IT staff can stem from fears of losing control, traditional roles becoming obsolete, or being bypassed in the procurement process (Khalil et al., 2017). However, allowing this skeptical staff to dictate the future cloud strategy can hinder progress (McAfee, 2011). Thus, embarking on the cloud journey needs to be pushed by CEOs and senior management (McAfee, 2011). Methods to mitigate resistance from the workforce towards the change encompass demonstrating the cloud benefits, communicating success stories and letting the staff experience the advantages firsthand (Wulf et al., 2019). In summary, organizations need to be aware of potential skepticism among the workforce towards the cloud and employ strategies to address concerns.

The adoption of SaaS within organizations is influenced by technological, organizational, and environmental readiness of users. Technological readiness involves the perceived benefits, ease of use, and the system's compatibility with existing processes (Yang et al., 2015). These factors affect how organizational users evaluate the technical aspects of adopting SaaS solutions (Yang et al., 2015). Organizational readiness is largely driven by internal IT infrastructure capabilities and the support of top management, which underscores the importance of leadership in technology adoption initiatives (Yang et al., 2015). Environmental readiness

describes the external pressures from competitors and partners, which can drive an organization towards adopting SaaS due to the perceived need to maintain competitive advantage or comply with industry standards (Yang et al., 2015). To summarize, these three categories underscore the need for a holistic approach in preparing users for SaaS adoption, ensuring that organizations are not only technically prepared but also strategically aligned and externally driven to successfully implement SaaS solutions.

Digital literacy among employees plays a key role in the adoption and utilization of cloud technology within an organization. Employees' attitudes towards technology, coupled with their perceived ability to use these technologies, influence their technology usage behaviors (Cetindamar et al., 2024). This also holds true for the specific case of cloud computing technologies. Thus, the digital literacy of an organization's workforce, which can be defined as a "competence consisting of the abilities of employees in utilizing digital technologies in work-related practices resulting in the use of technologies" (Cetindamar et al., 2024, p. 7845), not only facilitates a better understanding and use of cloud technologies but also drives digital transformation initiatives (Cetindamar et al., 2024). However, despite the availability of such services, there is often a gap in how well employees can use them to achieve innovation (Cetindamar et al., 2024). To capitalize on the benefits of cloud computing, organizations must first assess the digital literacy of the workforce, and subsequently invest in training programs to equip their employees with the necessary digital skills (Cetindamar et al., 2024). Overall, supporting the workforce to enhance their digital literacy aids organizations in adopting cloud technology.

Table 8 provides a summary of the identified challenges and best practices per category.

5.3 Discussion

The literature review reveals that while academia has not neglected socio-technical implications of cloud adoption, most of the sources focus on single aspects, thus failing to provide a holistic view of the cloud's organizational impact. Especially in the management domain, literature on cloud adoption is sparse. Organizations lack guidance from research when embarking on cloud transformation. Therefore, the next chapter presents the results of the multiple case study that examines the socio-technical effects of cloud adoption in real world settings.

Socio-Technical Challenges and Best Practices		
Category	Challenges	Best Practices
Strategic and Organizational Implications	<ul style="list-style-type: none"> • Changed Roles and Responsibilities of In-House IT • IT Units Need to Develop Business Understanding <ul style="list-style-type: none"> • Need to Manage Vendor Relationships • Need to Consider Security and Regulation • Shift in Application Decision Rights 	<ul style="list-style-type: none"> • Assigning Traditional IT Units a More Strategic Focus • Considering Organizing IT Department as Cost or Profit Center Depending on Cloud Provider's Competitive Environment • Fostering Business Understanding of IT Units
Impact on Processes and Way of Working	<ul style="list-style-type: none"> • Cloud Adoption May Increase Inertia of Traditional IT Units <ul style="list-style-type: none"> • Fear of Job Loss Among IT Units • Transitioning From Separate Infrastructure and Development Roles Takes Time • Lack of Knowledge Among Developers to Fully Leverage Cloud Tools 	<ul style="list-style-type: none"> • Leveraging Cloud to Increase Agility • Viewing Cloud as Chance to Foster Self-Organizing Teams • Leveraging Cloud to Foster Dynamic Capabilities
People-Based Factors	<ul style="list-style-type: none"> • Resistance, Especially Among On-Premise Experts • IT Units' Fear of Losing Control and Being Bypassed • Employees Often Struggle to Leverage Cloud Services for Innovation 	<ul style="list-style-type: none"> • Top Management Needs to Push Cloud Adoption • Demonstrating Benefits and Letting Workforce Explore Them Firsthand • Fostering Technological, Organizational, and Environmental Readiness of Users • Assessing Digital Literacy and Employing Training Programs

Table 8: Socio-Technical Challenges and Best Practices Identified in the Literature Review

Source: Own Representation

6 Socio-Technical Factors of Cloud Adoption – Insights From Practice

This chapter approaches RQ 2.1: *What socio-technical factors influence the success of cloud adoption in organizations?* and RQ 2.2: *What are challenges and best practices associated with cloud adoption?* from a practical point of view by presenting the results of the multiple case study. First, I describe each of the three cases (MediaCorp, InsuCorp, and SoftwareCorp) individually in a within-case analysis, followed by a cross-case analysis that explores similarities and differences between the three cases. The analyses primarily draw upon interviews conducted within each organization, supplemented by archival data such as magazine articles and presentations. Every within-case analysis starts with a case introduction that provides a general description of the company, states the motivation for the cloud adoption, and gives an overview of the cloud situation at the respective organization. This case description is followed by the main analysis of the interviews and archival data, aiming to identify socio-technical challenges and best practices associated with the cloud adoption of the respective company. Note that not every best practice is associated with exactly one challenge and vice versa. For a given challenge, there may exist several best practices, or none at all. Likewise, a given best practice may be associated with several or none challenges. Thus, a set of closely related challenges and best practices is grouped into a success factor. The within-case analyses are structured along these success factors.

6.1 Case 1: Cloud Transformation at MediaCorp

6.1.1 Case Introduction

MediaCorp is a media and entertainment company with a strong focus on television and digital content. It is primarily active in the German, Austrian and Swiss market. With several television channels and a streaming platform, the enterprise offers a diverse mix of entertainment and information content. MediaCorp is currently undergoing a cloud transformation (E4: 35; E11: 14; E14: 32; Archival Source 1, 2024).

There are several drivers for the cloud transformation at MediaCorp. While traditional linear television heavily relies on on-premise data center, the growing relevance of digital streaming requires MediaCorp to shift more of its system landscape to the cloud (E11: 14). The scalability of cloud services allows MediaCorp to better adapt to peak loads native to the media sector (E11: 18; E12: 24; Archival Source 2, 2022). Further, cloud technology enables the company to be more flexible, i.e., to launch new products quickly, test them, and easily discontinue them if necessary (E11: 18; E12: 24; E19: 30). Another motivation for the cloud transformation is the improved cost transparency of cloud services in comparison to on-premise systems, which facilitates more informed decision making (E19: 30). Additionally, with the increasing difficulty of finding IT talent in Germany, cloud services allow the company to focus its workforce on tasks that generate the most value rather than maintaining infrastructure (E9: 37; E11: 18).

MediaCorp pursues a cloud-first strategy (E11: 16; E12: 16; E15: 22; Archival Source 3). A cloud-only strategy is not feasible due to the specific needs of the media industry, such as issues with latencies, resulting in a combination of cloud services and on-premise data centers (E9: 31; E11: 16; E12: 16; E14: 20). The preferred approach for any new applications is to use a SaaS solution (E11: 16). If there is no SaaS option available and development is necessary, the preference is to build in the cloud (E11: 16; Archival Source 4, 2024). However, if specific reasons require the need, MediaCorp deploys applications on-premise (E11: 16; E12: 16).

The decision to start a cloud transformation was a mixture of top-down management decisions and bottom-up employee initiatives, with top-down prevailing (E9: 39; E11: 22; E12: 26; E14: 24). The scope of the cloud transformation is enterprise-wide (E11: 24; E12: 18; E15: 28). All three service models (IaaS, PaaS, and SaaS) are relevant for MediaCorp (E4: 30-31; E9: 24-25). Due to limited resources, MediaCorp has opted to primarily collaborate with a single hyperscaler, AWS (E11: 20). Thus, the company follows a single cloud strategy overall (E4: 29). Only for certain use cases, Azure and GCP are employed. For example, Azure is used by the IT infrastructure team for authentication services (E9: 33).

6.1.2 Socio-Technical Success Factors, Challenges, and Best Practices at MediaCorp

Success factors for the cloud transformation of MediaCorp encompass cloud governance and coordination, communication and exploration of the cloud's added value, the establishment of organizational cloud units, cloud skills among the workforce, and awareness of a new financial paradigm induced by the cloud transformation.

Cloud Governance and Coordination

To strategically guide the cloud transformation, MediaCorp developed a cloud operating model and a cloud governance framework, along with conducting a cloud assessment project to evaluate the suitability of its current on-premise systems for cloud usage. Despite these structured efforts, challenges arise due to poor coordination between initiatives and limited awareness among cloud experts within the organization.

While MediaCorp currently pursues a cloud-first strategy, the company does not view the cloud as a strict dogma. Expert 4 (35), who is leading the infrastructure division at MediaCorp, emphasizes the necessity of developing a robust infrastructure strategy to address foundational problems instead adhering to any specific technological pattern, such as cloud-first. MediaCorp prioritizes long-term profitability and operational efficiency over adherence to any single technology vendor or platform, advocating for a pragmatic approach towards technology decisions (E4: 35). Expert 4 describes the approach as follows:

“And what we have to do in infrastructure, [...] is that we have to solve infrastructural problems, regardless of which technology layer is underneath. In other words, we have to solve infrastructural problems in such a way that they meet the requirements, regardless of whether it is at AWS or at our data center. [...] And whether that is cloud-first or data center first or something else, how can you say what will work in 1, 2, 3 years? You always have to look at what pays off, what is best, and

that is what I do. And not commit yourself to one technology. And that is the approach we have in the infrastructure strategy" (E4: 35).

This flexible approach can be illustrated at the example of industry-specific requirements in the media sector, which hinder MediaCorp from a dogmatic attitude towards the cloud. While the cloud offers benefits such as reduced time-to-market and enhanced transparency in IT operations, it is not suitable for certain broadcasting processes, like cutting, where lower latency of on-premise solutions is essential (E4: 39, 109). Therefore, while MediaCorp acknowledges the benefits of cloud solutions for certain aspects of their operations, they maintain a significant portion of their IT infrastructure on-site to support production activities (E4: 39). The recent construction of a state-of-the-art on-premise data center, initiated by prior management, is another factor that keeps the company from committing exclusively to cloud solutions (E4: 39). This infrastructure strategy is designed to remain responsive to the company's changing needs and the unpredictable nature of technology trends to achieve commercial success in the long run.

To strategically govern the cloud transformation, MediaCorp defines a cloud operating model and a cloud governance framework. The cloud operating model describes how the company pursues to create value through cloud adoption (E4: 131). In essence, this model serves as a business model of the cloud adoption in the enterprise, outlining the necessary actions to generate value through cloud technologies (E4: 131). The methods by which these actions are implemented are defined within the cloud governance framework (E4: 131). This includes specifics on account setup, technology use, network configurations, and ensuring security (E4: 131). MediaCorp has established the Cloud Competence Center, an organizational unit which is responsible for overseeing the cloud governance framework (E11: 46). This responsibilities of this team are further described in the section of the next success factor (*Establishing Organizational Cloud Units*). To summarize, the cloud operating model defines what to do to create value, and the cloud governance model describes how to operationalize these steps. In combination, these definitions allow for a focused cloud transformation approach.

After defining a cloud operating model and a cloud governance framework, MediaCorp conducted a cloud assessment project to evaluate the feasibility and benefits of migrating specific applications to the cloud. Over several months, the project team, comprising primarily architects and leadership, reviewed the existing on-premise applications to determine their suitability for cloud migration (E11: 12; E15: 76). This evaluation involved assessing whether it made sense to move each application to the cloud from an architectural and financial point of view (E15: 76). The process was collaborative, involving product owners, architects, developers, and system engineers to gain a profound understanding of the respective applications (E15: 80-82). The purpose of the assessment was not merely to shift systems to the cloud but also to thoroughly document reasons for the decisions to avoid repetitive future discussions about cloud suitability (E15: 76). To illustrate, one specific result of the cloud assessment project was to migrate their complete on-premise Kubernetes platform to the cloud (E11: 12). This decision is attributed to two factors: first, Kubernetes is easily adaptable to the cloud, and second, the company avoids massive hardware investments in the next two years to maintain the system on-premise (E11: 12).

Despite MediaCorp's strategic efforts towards a structured cloud transformation, limited networking and insufficient communication among cloud experts present challenges in the company's cloud transformation efforts. In the company, many cloud experts are unaware of each other, as each unit pursues its initiatives independently with little awareness of others' efforts (E12: 30). Expert 9 (77) stresses that problems in cloud initiatives typically are not caused by insufficient technical skills, but rather by a lack of communication and willingness to seek for help when issues arise. This isolated approach towards cloud projects hinders the development of standardized technical solutions (E12: 30). The problem originates from the historical evolution of cloud adoption the organization (E12: 32). Some smaller assets were cloud-native from the beginning and operate with a degree of independence, while other parts of the organization are just starting their cloud transformation (E12: 32). Additionally, the existence of multiple specialized cloud teams leads to overlapping responsibilities and redundant work (E15: 98). To address this challenge, it is necessary to foster awareness and connectivity among its cloud professionals (E12: 30).

Table 9 summarizes the challenges and best practices related to cloud governance and coordination at MediaCorp.

MediaCorp		
Success Factor	Challenges	Best Practices
Cloud Governance and Coordination	<ul style="list-style-type: none"> • Lack of Awareness and Networking Among Cloud Experts • Lack of Communication in Migration Projects 	<ul style="list-style-type: none"> • Not Using Cloud Dogmatically; Infrastructure Strategy Over Cloud Strategy • Defining Cloud Operating Model and Cloud Governance Framework • Conducting Cloud Assessment Project • Fostering Awareness and Networking Among Cloud Experts

Table 9: Challenges and Best Practices Regarding Cloud Governance and Coordination at MediaCorp

Source: Own Representation

Value Communication and Exploration

Coming from a history of unsuccessful cloud initiatives under previous management, MediaCorp occasionally encounters resistance to cloud adoption. To foster widespread acceptance, the company aims at clearly communicating the added value of cloud technology and enabling employees to explore its practical benefits firsthand.

Communicating the added value of cloud transformation is a key factor in achieving acceptance for the new technology at MediaCorp, especially due to the company's history of unsuccessful cloud approaches. Past adoption efforts under prior management often failed, partly due to a confrontational approach within the company, characterized by a "us versus them mentality" among departments (E19: 36-38). A top-down management style where cloud adoption was mandated rather than collaboratively pursued further contributed to the negative attitude of many stakeholders towards the cloud (E19: 38). These internal conflicts and the lack of a clear vision have underscored the need for better communication of the value

and challenges of cloud adoption (E19: 38). For the new management, an important strategic motivation for the cloud transformation represents the use of cloud technology not only to save costs and enhance technical efficiency but also to optimize human resources by purchasing standardized cloud solutions (E11: 12). To illustrate, the company has set up an on-premise Kubernetes cluster, which is tedious to operate and maintain, for instance due to the associated storage system approaching its end of life and the underlying host operating system no longer receiving security updates (Archival Source 4, 2024). Instead of managing the on-premise Kubernetes platform, MediaCorp reallocates the responsible experts to higher-value tasks that capitalize on their skills, like developing new applications, and thus maximizes the overall value creation within the company (E11: 12).

However, there still are situations where employees are resistant towards certain migration projects, especially when the benefits are not effectively communicated or understood, or if the motivation for the change stems from purely financial reasons (E12: 38; E19: 40). For migration projects, significant internal resources must be utilized; yet, the immediate benefits of such migrations are often not apparent, as the cloud version of a tool might only offer a few additional features or slight improvements compared to the previous on-premise version (E14: 80). This lack of visible short-term value can lead to resistance among stakeholders who lack the understanding for the mid-term implications of the cloud transformation (E14: 80). These stakeholders might feel that the effort is unwarranted since it does not deliver substantial immediate benefits and could potentially continue to operate effectively on-premise (E14: 80). For instance, in a data warehouse migration, resistance among the workers tasked with the project arose from the perception that the new cloud system did not offer additional value compared to the previous on-premise setup (E12: 38). The turnaround in attitude occurred when the company invested in better communication and technical demonstrations, helping employees understand the substantial advantages of the new system, not just in terms of cost but as a transformation in the way they work (E12: 38). Expert 12 describes the situation as follows:

“It is about essential added value. So, I am not replacing a machine in the basement with a machine in another data center, one-to-one, and then it is somehow cheaper, or it makes sense overall, but no, we are transforming the way we work, we are gaining a lot of added value. At some point, something clicked. I believe that when there is resistance quickly, when I only do it because my boss wants me to, in other words when things like that resonate, then I think resistance comes very quickly, and that is also what I perceive in other places on the left and right. If it is not well understood what the added value behind it is, and it is a real added value and not that a bill is smaller or larger somewhere, then there will be resistance if it is just seen as a technical gimmick” (E12: 38).

This point of view is supported by the CEO of MediaCorp’s enterprise IT company, who on the one hand stresses the importance of communicating the reasons behind the cloud transformation, especially to skeptical employees, and on the other hand recognizes the need to let the staff practically explore the added value the cloud offers for their individual work (E11: 34). To illustrate, one advantage that fundamentally changed the way the data team works are zero-copy clones, which allow for multiple logical copies of data without actual replication

(E12: 44). This capability has been a game-changer, as it allows each developer to work independently without hindering each other when working in parallel on the same data, and to integrate their work seamlessly (E12: 44). This shift has significantly sped up processes, that used to take months or years, as developers can now automatically deploy environments and start with a complete, automated setup at the push of a button (E12: 44). Expert 12 gives an insights into how a workshop, that demonstrated the added value of the cloud in the data domain, has led to a shift in the mindset of the workforce:

“I can remember, we also held workshops to really bring out this added value, not this technical gimmick, I am replacing one-to-one, and the breakthrough for us was actually the first big change in the way people work. That was when it really clicked for everyone. From then on, it was a no-brainer, and since then, a lot of value has been added” (E12: 40).

This example underscores the importance of both effective value communication and firsthand exploration in overcoming resistance towards cloud migration initiatives.

Nevertheless, it is important to not only communicate the benefits for individuals, but also to explain the benefits in a broader enterprise context. Developers, for instance, often focus solely on the functionality of applications rather than the underlying hardware, showing little concern whether their apps run in the cloud or in the on-premise Kubernetes cluster MediaCorp maintains (E19: 42). They are resistant to move their existing apps to the cloud and see no need for change because the Kubernetes cluster is well-functioning (E19: 42). However, MediaCorp plans to migrate its Kubernetes cluster to the cloud due to the significant resources required to maintain it on aging hardware (E19: 42). Thus, it is crucial for the management to communicate the enterprise context of the initiative to gain support of developers (E19: 42).

Table 10 gives an overview of the challenges and best practices concerning the communication and practical exploration of the cloud’s added value at MediaCorp.

MediaCorp		
Success Factor	Challenges	Best Practices
Value Communication and Exploration	<ul style="list-style-type: none"> • History of Failed Cloud Initiatives Led to Internal Conflicts • Resistance Towards Migration When Added Value Is Not Understood or Purely Financially Motivated 	<ul style="list-style-type: none"> • Communicating and Practically Demonstrating Added Value of the Cloud • Letting Employees Explore Added Value (e.g., in Workshops) • Explaining Added Value in Enterprise Context When There Is No Direct Impact on Individuals

Table 10: Challenges and Best Practices Regarding Value Communication and Exploration at MediaCorp

Source: Own Representation

Establishment of Organizational Cloud Units

At MediaCorp, the formation of specialized cloud teams, i.e., the Cloud Competence Center, the Cloud Core Team, and the Cloud Enablement Team, marks a strategic approach to facil-

tate its cloud transformation. However, coordinating these different units is challenging, leading to redundancies and overlapping responsibilities.

MediaCorp established the Cloud Competence Center as part of the company's cloud transformation efforts. This is not an operational units tasked with migration projects, but rather takes care of overarching cloud topics in the enterprise (E11: 42; E12: 32). This includes contract management with cloud providers and ensuring compliance with aspects of the cloud governance framework, such as identity and access management, logging and monitoring, and security (E5: 55). The team governs these aspects not merely by simply instructing the other units via email, but by technically ensuring that certain standards are upheld (E12: 32). As part of a strategic reorganization to better support the cloud transformation, the Cloud Competence Center is transitioning into a new team structure (E11: 42). This reorganization involves splitting the functions into two teams: the already existing Cloud Core Team and the new to be formed Cloud Enablement Team (E11: 42).

The Cloud Core Team, established following unsuccessful cloud initiatives, was originally a cross-functional, virtual team formed by volunteers from various departments who worked part-time alongside their main responsibilities (E9: 41-43; E15: 94). Over time, this evolved into a more formalized full-time team as the company, driven by top-down decisions, increased its focus on cloud initiatives (E15: 94-96). In contrast to the Cloud Competence Center, the Cloud Core Team is more focused on operational tasks, such as ensuring that pre-configured accounts are in place and security compliance is met (E11: 42). Many team members originate from an on-premise background and have upskilled themselves regarding cloud topics (E9: 43). Roles in the Cloud Core Team include cloud architects, DevOps engineers, and occasionally an agile coach to facilitate daily meetings and planning sessions (E15: 96).

MediaCorp is soon to form the Cloud Enablement Team. This team is not tasked with directly carrying out migration projects work but rather with enabling other teams to create value-adding products in cloud environments (E19: 44). Thus, the primary function of the Cloud Enablement Team is to support other teams during the cloud migration projects by facilitating upskilling and helping shift existing applications to the cloud (E19: 44). Previous to the cloud adoption, teams were accustomed to a model where obtaining hardware could take up to six months, or they could easily consult peers for issues related to technologies like Kubernetes without delving deeper into the problem-solving process (E19: 44). The shift to AWS and cloud-based platforms introduces a new paradigm where teams are provided with more capabilities but are also tasked with greater responsibilities, requiring them to develop new technical skills and adopt innovative approaches to problem-solving (E19: 44). The Cloud Enablement Team is supposed to empower the other teams to follow this new paradigm by fostering a proactive rather than a reactive mindset towards technical challenges (E19: 44). Expert 19, who will lead the Cloud Enablement Team, summarizes the team's role as follows:

“In other words, this enabling team concept, cloud enabling team concept, addresses this change management. How do I support teams in their migration so that the team learns new things and is upskilled with the first goal and the application is actually migrated in the second goal? This is the basic idea behind the enabling team” (E19: 44).

Ideally, the team's composition combines technical expertise with strong communication and mentoring skills to effectively guide and reassure team members through the migration process (E19: 46). This dual focus helps in making the migration as smooth as possible by addressing both technical challenges and human factors involved in the cloud transformation at MediaCorp.

Despite the specialized skills of the established cloud teams, challenges such as overlapping responsibilities among the multiple cloud-oriented teams have led to redundancy and coordination issues (E15: 98). To overcome these problems, a more streamlined approach would be beneficial to coordinate the various organizational cloud units (E15: 98). Expert 15 (100) suggests a thorough analysis of each team's specific functions, followed by a potential realignment of the units. Such restructuring would potentially enhance coordination and prevent duplication of efforts, thereby improving the efficacy of MediaCorp's cloud transformation.

Table 11 provides a summary of the challenges and best practices that relate to the establishment of cloud units within MediaCorp.

MediaCorp		
Success Factor	Challenges	Best Practices
Establishment of Organizational Cloud Units	<ul style="list-style-type: none"> • Coordination of Different Cloud Units • Overlapping Responsibilities of Different Cloud Units 	<ul style="list-style-type: none"> • Establishing Cloud Competence Center to Govern Cloud Activities in the Company • Establishing Cloud Core Team as an Operational Unit • Establishing Cloud Enablement Team to Enable Others for Cloud Migrations

Table 11: Challenges and Best Practices Regarding the Establishment of Organizational Cloud Units at MediaCorp

Source: Own Representation

Cloud Skills Among the Workforce

As the cloud transformation necessitates new skills within the workforce, MediaCorp, often struggling to find experienced experts in the job market, offers a broad range of training options. The company relies on a combination of theoretical and practical learning. To reduce the complexity of the transformation, they focus on AWS as their main cloud provider.

At MediaCorp, the cloud transformation increases the complexity of traditional IT infrastructure tasks, driving a shift towards more coding-oriented tasks. The adoption of cloud technologies necessitates the transformation of work from manual configuration and setup to a coding-centric approach, where infrastructure and operations are managed as code using technologies such as Terraform and Python scripts (E15: 44). Especially authentication in the cloud is a complex issue for the infrastructure team (E9: 59). This evolution not only increases the complexity of tasks but also demands a new skill set from IT employees (E9: 59; E15: 46, 48). Particularly for those coming from an on-premise background, there is a need to acquire familiarity with specific cloud services, such as AWS, and to master new tools and technologies that were less relevant in the previous setup, including GitLab CI and Terraform (E15: 48). To reduce the complexity of the cloud transformation, MediaCorp employs a sin-

gle-cloud strategy, focusing on AWS as their main cloud provider (E4: 125; E11: 20; E19: 24).

The cloud transformation at MediaCorp fosters a culture of more personal responsibility among software developers. While traditionally developers had to rely on colleagues to get hardware and wait up to six months, they can allocate these resources themselves in cloud environments like AWS within minutes (E19: 44). On the one hand, this gives them new opportunities, on the other hand, they also have new responsibilities, as they cannot rely on their colleagues to fix issues anymore (E19: 44). To learn the skills necessary for navigating and operating in AWS, the Cloud Enablement Team assists application owners in migration projects, aiming to upskill them during the process (E19: 44). To illustrate, this upskilling can include rethinking architectural patterns that may not work well in the cloud, such as applications that rely on shared filesystems (E19: 44). This enablement concept also demands new skills from the members of the Cloud Enablement Team. In addition to the technical understanding necessary to guide others, they must also possess strong coaching and mentoring abilities (E19: 46). These skills are crucial for effectively communicating with other teams, alleviating their concerns, and fostering an environment that supports effective learning (E19: 46). To summarize, the cloud transformation requires developers and members of the core cloud team to acquire a range of skills, from technical expertise and personal responsibility to communication abilities.

Based on the experts' statements, there are mixed opinions about the shortage of skilled cloud professional in the company. MediaCorp faces a situation where the cloud transformation does not lead to a significant reduction of its own data centers, but rather supplements them (E9: 109). Thus, in the infrastructure division, cloud technology has not led to job cuts; instead, it rather necessitated the creation of additional positions (E9: 85). This is partly due to the need for specialists who can manage both traditional on-premises solutions and new cloud-based initiatives (E9: 85). The interviewed experts that work in the infrastructure division stated that they face severe difficulties finding skilled workers, especially in the cloud context (E4: 85-87; E9: 89). Similarly, an expert from the data division noted that attracting experienced cloud experts presents a challenge, whereas recruiting eager graduates with little experience but a strong willingness to learn proves much easier (E12: 48). In contrast, MediaCorp's CIO indicated that although locating cloud experts has been challenging over the past six months, it is currently not a significant issue (E11: 54). Instead, the difficulty lies more in recruiting experts for roles related to specific products, such as ServiceNow or SAP (E11: 54).

To equip the employees with the necessary cloud skills, MediaCorp offers a wide range of training options. Regular meetings are used as a platform to introduce and discuss cloud-related topics, encouraging the workforce to experiment with cloud technologies (E9: 71). Further, employees can engage with online platforms such as Udemy and AWS Skillbuilder or opt for traditional classroom training for more direct interaction with instructors (E4: 79; E9: 71; E11: 36). Having direct exchange with cloud providers on a regular basis also turned out to be an effective means for continuous learning and facilitating communication (E12: 46). Moreover, peer-to-peer knowledge transfer within the company is an effective approach, even though this could be better facilitated in the broader organizational context (E12: 46). The company also subsidizes cloud conferences like AWS Summit or re:Invent (E4: 79).

While not specifically limited to cloud topics, IT employees of MediaCorp are allowed and encouraged to spend 20 percent of their work time for further education (E15: 54). During this time, employees can pursue certifications in AWS and Terraform, for example, with all associated costs covered by the company. (E11: 36; E15: 54). Yet, MediaCorp recognizes that solely theoretical knowledge gained by certifications is limited in value, and thus aims at coupling this type of education with practical experience (E4: 79; E12: 46). To achieve this, the company employs so-called playgrounds where employees can experiment with new technologies in a risk-free environment (E11: 36; E12: 46). For instance, the company introduced an AWS playground, which is an environment where employees can freely deploy resources to test and experiment without concern for setup or long-term implications, as the deployed resources are reset daily (E4: 79; E9: 71; E15: 56). Finally, MediaCorp uses team augmentation by engaging external service providers who work alongside in-house teams to upskill them (E4: 63). To summarize, the company offers a variety of training options that equip employees with the necessary skills for successful cloud adoption.

Table 12 recaps the challenges and best practices regarding the skills and knowledge of cloud systems among MediaCorp's workforce.

MediaCorp		
Success Factor	Challenges	Best Practices
Cloud Skills Among the Workforce	<ul style="list-style-type: none"> • Cloud Requires New Technical Skills (e.g., Infrastructure as Code) • Cloud Increases Developers' Responsibilities • Cloud Requires Communicational and Mentoring Skills for Cloud Enablement Team Members • Often Hard to Find Cloud Experts on the Job Market 	<ul style="list-style-type: none"> • Focusing on One Cloud Provider to Reduce Complexity • Forming Cloud Enablement Team to Upskill Others • Offering Many Training Options (e.g., Udemy and Certifications) • Allowing IT Staff to Allocate 20% of Work Time for Training and Further Education • Combining Theoretical and Practical Training (e.g., by Providing Playgrounds) • Learning From External Service Providers in Team Augmentation

Table 12: Challenges and Best Practices Regarding Cloud Skills Among MediaCorp's Workforce

Source: Own Representation

Awareness of Changed Financial Paradigm

Cloud adoption shifts cost structures from capital expenditures (CapEx) to operational expenditures (OpEx), which is challenging for MediaCorp, especially as a publicly traded company under high cost pressure. To address this issue, MediaCorp must clearly explain this shift to both internal and external stakeholders. It is also vital to consider the indirect financial benefits of cloud adoption, beyond the direct costs.

At MediaCorp, the transition from CapEx to OpEx due to cloud adoption represents a conflict with traditional financial paradigms. As a publicly traded company, MediaCorp is guided by

EBIDTA metrics, where investments that can be capitalized and depreciated are favored over operational spendings that impact earnings immediately (E11: 14). In general, the company is heavily cost-driven (E9: 31; E19: 28), with decisions in cloud migration projects being based on the cost-performance ratio of on-premise versus the cloud (E9: 31). Thus, cloud adoption represents an intrinsic conflict in shifting from capital-intensive investments like hardware, which are depreciated over time, to OpEx incurred through cloud services (E11: 14). This misalignment between cloud strategy and traditional financial thinking has slowed the company's adoption of cloud services for years (E14: 28).

Further, a simplistic total cost of ownership analysis, often negative towards the disadvantage of the cloud, fails to capture the benefits of cloud integration, such as increased operational efficiency, which might justify higher costs for technical systems (E12: 58). To illustrate, Expert 9, who leads the IT infrastructure team at MediaCorp, stresses that from a solely financial point of view, simply migrating a system in a lift and shift manner, does not prove cost-efficient (E9: 113). He notes that cloud services are generally more expensive than traditional on-premise data centers when it comes to basic infrastructure provision, such as servers, stressing the need to adapt the systems to the new environment to leverage the cloud's capabilities (E9: 113).

Accurately capturing opportunity costs in an end-to-end business case evaluation also proves difficult for MediaCorp (E19: 28). Allocating traditional on-premise infrastructure is slow and involves complex processes that require collaboration across multiple departments (E19: 28). For instance, setting up a server could take three to six months from order to operation, involving several steps and teams for procurement, installation, networking, and storage integration (E19: 28; Archival Source 5, 2024). Once acquired, the hardware must be utilized for its entire lifespan, which can be problematic if the initial needs change or the reason for its purchase becomes irrelevant due to shifting priorities (E19: 28). This inflexibility hinders the organization, especially software development teams whose requirements might not be well-defined from the outset, resulting in high opportunity costs (E19: 28). In contrast, MediaCorp's cloud efforts aim to enhance flexibility and speed up deployment processes. Overall, the main challenge from a cost-perspective lies in monitoring and comparing different types of costs, such as IT infrastructure costs and personnel costs (E12: 58).

As the strategic shift towards the cloud initially appears detrimental to the traditionally favored financial metrics, it is important that the board understands the necessity of the transformation, and thus requires transparency and constant communication of the benefits with financial units such as controlling and accounting (E11: 14; E14: 30). Additionally, it is also crucial for MediaCorp to not only convince its internal financial units, but also to create a shift in how these types of costs are assessed by the stock market (E14: 30). To summarize, the challenge lies in accurately tracking and justifying these shifts across different categories of costs, and to sensitize the board for this new financial paradigm (E11: 14; E12: 58).

Table 13 summarizes the challenges and best practices involved in creating awareness of the new financial paradigm induced by cloud adoption at MediaCorp.

MediaCorp		
Success Factor	Challenges	Best Practices
Awareness of Changed Financial Paradigm	<ul style="list-style-type: none"> • Cloud-Induced Shift From CapEx to OpEx is Challenging, Especially as a Publicly Traded Company • Company Faces High Cost Pressure • Simplistic TCO Assessment Neglects Benefits of the Cloud • Hard to Compare Different Types of Costs, Especially Due to Opportunity Costs 	<ul style="list-style-type: none"> • Communicating and Explaining Shift From CapEx to OpEx to the Board, Internal Financial Units, and the Stock Market • Considering Indirect Financial Benefits of the Cloud (e.g., Operational Efficiency)

Table 13: Challenges and Best Practices Regarding the Awareness of a Changed Financial Paradigm at MediaCorp

Source: Own Representation

6.1.3 Case Summary

MediaCorp operates in an environment that has historically relied on on-premise infrastructure. As the industry shifts from linear television to streaming, the company recognizes the need for more scalable and flexible solutions (E11: 18). In response, MediaCorp has embarked on a cloud transformation. While at the moment the company generally adheres to a cloud-first strategy (E11: 16; E12: 16; E15: 22; Archival Source 3), it prioritizes developing an infrastructure strategy that addresses its overarching business goals (E4: 35). Recognizing that cloud-first is just one of many technical patterns, MediaCorp emphasizes choosing the right tools and approaches over strictly following any predefined methodology (E4: 35).

To strategically approach the transformation, MediaCorp has developed a cloud operating model and a corresponding cloud governance framework. The operating model outlines the necessary steps to leverage cloud technology for adding value within the company, while the governance framework specifies how these steps are to be operationalized (E4: 131). In addition, the company has conducted a cloud assessment project to systematically evaluate which systems can be shifted to the cloud (E11: 12; E15: 20).

Media Corp has also established new organizational units for the cloud transformation. The Cloud Competence Center oversees adherence to the cloud governance framework, while the Cloud Core Team focuses on operational aspects like supporting ongoing migration projects (E11: 42, 46). Additionally, MediaCorp is soon to form the Cloud Enablement Team (E11: 42, 46). This new unit is supposed to empower and upskill other units for current and future migration projects (E19: 44).

To equip the workforce with the necessary skills for the cloud transformation, MediaCorp offers a broad spectrum of training opportunities. This includes a mix of theoretical learning through online platforms like Udemy, as well as practical hands-on experience, for example AWS playground accounts where employees can experiment in a safe environment. In addition, IT staff at MediaCorp is encouraged to dedicate 20% of their work time to training and further education. To deuce the overall complexity of cloud adoption, MediaCorp follows a

single-cloud strategy by focusing on AWS as their main cloud provider. Such measures ensure that the company develops the necessary know-how to succeed in the transformation.

Despite these structured approaches, MediaCorp is confronted with challenges. For a long time, previous management insisted on avoiding cloud solutions in favor of expanding the in-house data centers, leading to a prolonged neglect of cloud technology in favor of traditional on-premise systems (E19: 28). Today, there is still resistance towards cloud migrations when the benefits are not understood (E12: 38). To mitigate this skepticism, it is essential for MediaCorp to clearly articulate the reasons behind the cloud initiatives and their added value (E11: 34). Besides pure communication, it is important for the company to let the employees practically explore the benefits of the cloud in their day-to-day work (E11: 40).

As a publicly traded company, the cloud-induced shift from CapEx to OpEx poses another challenge to the enterprise. Especially against the backdrop of high cost pressure (E9: 31), this change necessitates clear communication with internal and external stakeholders to foster understanding for the strategic transformation (E14: 30). Further, it is important for the company to not only assess cloud projects from a simplistic total cost of ownership perspective, but also to consider indirect financial benefits of the cloud adoption, for example enhanced operational efficiency (E12: 58).

In conclusion, the case analysis shows that MediaCorp has recognized the strategic importance of cloud technologies in the media sector, particularly as the industry shifts towards streaming services. Despite a challenging history of cloud adoption under previous management, MediaCorp is now on the path to cloud transformation. While the company faces numerous challenges, it is applying measures such as establishing specialized cloud units and upskilling the workforce to ensure success in their journey to the cloud.

Appendix E.1 consolidates all success factors, challenges, and best practices identified at MediaCorp into a single table.

6.2 Case 2: Cloud Transformation at InsuCorp

6.2.1 Case Introduction

InsuCorp is a leading global provider of insurance and financial services. Among others, its product portfolio encompasses life, health, and property insurance. The enterprise operates in dozens of countries worldwide, serving millions of customers. InsuCorp is undergoing a cloud transformation that started in 2017 (Archival Source 6, 2021).

Strategic goals behind InsuCorp's decision to initialize a cloud transformation encompass global infrastructure harmonization, quicker access to new technologies, shortage of skilled IT workers, and transferring security responsibility. As a company that has expanded through numerous mergers and acquisitions, InsuCorp faces the challenge of managing a heterogeneous mix of IT systems and products acquired from other companies (E13: 37; Archival Source 7, 2021). By leveraging cloud services, particularly those provided by hyperscalers, InsuCorp aims to achieve a standardized infrastructure across all its operational regions (E13: 37). In addition, InsuCorp seeks to improve its security and stability by transferring the responsibility

of managing security risks to cloud service providers, thereby reducing the internal burden of handling attacks (E17: 23). Moreover, the cloud transformation fosters access to new technologies, which are constantly developed further and released in short cycles by cloud providers (E13: 37; Archival Source 8, 2021). Finally, the company faces a challenge in finding IT experts due to a prevailing skills shortage (E17: 23). InsuCorp aims to mitigate this issue by outsourcing essential IT operations to cloud providers, thereby reducing the need to directly employ many IT specialists (E17: 23). Overall, by transitioning to cloud services, InsuCorp addresses operational challenges while strategically positioning itself to leverage technological advancements and mitigate staffing shortages.

InsuCorp pursues a cloud-first strategy, i.e., for new purchases, generally cloud services are used, and for existing use cases, migration strategies are developed (E5: 27; E13: 20, 35; Archival Source 6, 2021). Deviations from this behavior require an exception process (E5: 35; E17: 19-21; Archival Source 6, 2021). The decision to start a cloud transformation was a top-down decision by the top management of the enterprise (E5: 33; E17: 37-39). The scope of the cloud transformation is enterprise-wide and not restricted to individual domains (E5: 29; E17: 25). All three service models (IaaS, PaaS, and SaaS) are relevant for InsuCorp, however, there is a directive to use SaaS wherever possible (E5: 18-19; E17: 50.51). The company pursues a multi-cloud strategy (E5: 17, 27; Archival Source 6, 2021), working together with multiple cloud vendors like AWS, Microsoft, and Oracle (E5: 15-17). For each domain, the company has defined a leading cloud provider and others as a backup (E5: 27). For instance, in the data domain, Microsoft is the primary provider, whereas AWS takes the lead in the core insurance business (E5: 27).

6.2.2 Socio-Technical Success Factors, Challenges, and Best Practices at InsuCorp

Success factors for the cloud transformation at InsuCorp encompass the harmonization of its IT system landscape, the migration of systems with industry-specific requirements, the orientation on business cases, the cloud skills among the workforce, and the approach towards migration projects.

Harmonization of IT System Landscape

Exceptions from global blueprints, especially due to special requests from international colleagues, and a diverse application landscape within the cloud challenge the harmonization of the IT system landscape at InsuCorp. To overcome these challenges, sticking to global blueprint, including practitioners in architectural decisions, and focusing on certain technologies within the cloud offering.

The harmonization of its IT landscape was a motivation for InsuCorp to undergo a cloud transformation (E5: 41; E13: 37, 96; Archival Source 8, 2021), however, making exceptions from global blueprints poses a challenge to the company. For every domain, the top management of the enterprise has designed global architecture blueprints, which define binding standards, for example which cloud providers and which tools to use in each domain (E5: 35; E17: 35). To deviate from these blueprints, an exception process must be completed (E5: 35). According to Expert 5 (37), this approach is efficient in theory, because InsuCorp would have a much larger negotiating mass and could therefore achieve better prices when bargaining

with cloud vendors. While these guidelines are generally followed in Europe, other parts of the world like the United States and Asia make a lot of exceptions (E5: 37). Expert 5 describes this situation as follows:

“So, Europe is somehow all the good citizens here, but if you look to the left and right of the globe, it is chaos. So that means we have to somehow make a move to say that we are more consistent and if we were to follow through with it, then we would probably have a billion less costs” (E5: 37).

While there are some reasons that justify deviating from the standards like different regulations that apply to the insurance industry in different countries, the multitude of exceptions takes away the leverage from a global bargaining chip (E5: 39). Overall, the many exceptions conflict with the overarching goal of the cloud transformation, i.e., harmonization of IT systems (E5: 41; E13: 37, 96).

Shifting from on-premise to the cloud does not necessarily lead to a more harmonized application landscape. While hyperscalers like AWS provide a harmonized infrastructure, they still offer a variety of choices regarding the application landscape, such as multiple database technologies including Oracle, DB2, PostgreSQL, Redshift, and various NoSQL databases (E13: 39, 96). Similar to the divergent on-premise landscape, these many options can lead to a “zoo” of short-lived systems (E13: 96), where managing these different systems requires specific expertise for each, even though infrastructure maintenance is reduced (E13: 98). Thus, it is important to focus on certain technologies, even though this means functional limitation (E13: 98). While InsuCorp employs architectural review boards to ensure harmonization, the absence of practitioners in these boards leads to decisions being made on oversimplified PowerPoint presentation rather than practical expertise (E13: 98).

Table 14 provides a summary of the challenges and best practices that concern the harmonization of InsuCorp’s IT system landscape.

InsuCorp		
Success Factor	Challenges	Best Practices
Harmonization of IT System Landscape	<ul style="list-style-type: none"> • Making Many Exceptions From Global Blueprints • Special Requests From International Colleagues • Cloud Adoption Does Not Automatically Mean Application Harmonization 	<ul style="list-style-type: none"> • Being Consistent and Sticking to Blueprints • Including Practitioners in Architectural Boards • Focusing on Certain Technologies Within the Cloud Offering

Table 14: Challenges and Best Practices Regarding the Harmonization of the IT System Landscape at InsuCorp

Source: Own Representation

Migration of Systems With Industry-Specific Requirements

Special requirements in the finance and insurance sector like compliance with regulation and the longevity of products pose challenges to InsuCorp in their cloud migration efforts. These issues can be mitigated by migrating rather the business products like insurance contracts than

the technical legacy systems behind them, and by abstaining from special features and sticking to standard functionalities of cloud offerings.

Ensuring regulatory compliance is challenging when integrating cloud services in the finance and insurance sector. This industry is regulated by the BAFIN or the European Union, for example (E5: 31; E13: 16). However, there is a gap between the services provided by cloud vendors and the expectations of the regulators (E13: 18). To bridge this gap, significant modifications and enhancements are required to achieve compliance to regulation, illustrating the complex nature of cloud integration in systemically important financial institutions (E13: 18).

Next to regulation, another challenge that increases the complexity of cloud migrations in the finance and insurance industry is the longevity of products. Long-living legacy products like insurance policies sold decades ago must be maintained despite no longer being actively sold due to legislative changes (E13: 20). These products, created under old regulations, must be supported until their contractual obligations expire, for instance due to the death of the insured (E13: 20). This situation necessitates maintaining legacy IT systems that do not generate new revenue but are essential for managing existing contracts (E13: 20). In addition, these older systems were often built in programming languages that are not designed to run in cloud environments and are only rarely taught at universities (E13: 22-28).

Instead of technically migrating these old systems to the cloud, it might be more practical to migrate the underlying business aspects, such as transferring contracts to newer products, rather than reconstructing outdated IT systems (E13: 35). This approach is driven by the considerable differences in technology and resource costs between past and present systems, which can dramatically increase infrastructure costs if migrated to modern frameworks (E13: 35). Expert 13 reflects on the situation as follows:

“My personal view is that we should not migrate technically, but at business level. This means that we would rather convert a contract to a different product than rebuild an IT system that is very difficult to rebuild. Because the colleagues who programmed 40 years ago worked a little differently. Because every bit was precious. And the people who have to look at things nowadays lack any understanding of why it is like this” (E13: 35).

The overarching issue is the high cost of migration and the lack of straightforward solutions, requiring detailed analysis of each case to determine the best approach while considering the interactions with other systems and the overall impact on business operations. This complex scenario has led to ongoing deliberations within the company on how best to handle legacy systems in the cloud migration context, with no easy answers found yet (E13: 35).

The longevity of products not only poses challenges when migrating legacy systems, but also in the selection of cloud services for new products. In particular, companies are required to retain records for long periods of time, for example 12 years according to the principles of proper accounting (E13: 39). Such requirements necessitate a cloud infrastructure that supports long-term viability and stability of applications without the need for frequent changes. Expert 13 emphasizes the need to consider long-term effects:

“But the challenge is that we then have application lifetimes in certain areas. I would like to mention the principles of proper accounting. That’s twelve years. Then I always ask the question: Which cloud stack do we choose now if it is still going to work in twelve years’ time? Then you have to think about what to do, because the regulator wants you to be able to go back twelve years. You do not want to change the stack three times during this period” (E13: 39).

To tackle these challenges, InsuCorp creates abstraction layers to virtualize contracts and intentionally limit the use of certain features (E13: 41). To illustrate, this involves using standard SQL instead of specialized dialects, which functionally restricts the system but enhances future compatibility (E13: 41). In summary, it is critical to assess the chances of the used technologies to outlast the lifecycle of the insurance product to avoid future incompatibility (E13: 41).

Table 15 gives an overview of the challenges and best practices that relate to the migration of systems with industry-specific requirements.

InsuCorp		
Success Factor	Challenges	Best Practices
Migration of Systems With Industry-Specific Requirements	<ul style="list-style-type: none"> • Cloud Providers Often Do Not Design Systems Compliant With Regulation • Need to Adapt Systems According to Regulation • Longevity of Products Increases Complexity of Migration • Need to Keep Systems Alive That Do Not Make Money • Legacy Systems Based on Legacy Programming Languages That Do Not Work in the Cloud 	<ul style="list-style-type: none"> • Migrating Business Aspects Rather Than Legacy Systems • Abstaining From Features • Sticking to Standards

Table 15: Challenges and Best Practices Regarding the Migration of Systems With Industry-Specific Requirements at InsuCorp
Source: Own Representation

Business Case Orientation

At InsuCorp, it is necessary to understand the business implications of cloud migration, especially over the full lifecycle of the services. In some use cases, the cloud cannot match the performance or cost efficiency of on-premise systems; in others, customization requires a lot of effort due to the frequent updates of cloud software.

Employing a cloud-first strategy dogmatically independent of the business cases can pose a challenge, as shifting to the cloud does not universally guarantee superior performance or cost efficiency. Regulatory relaxation for cloud usage in the finance and insurance sector and hypothetical business cases have fostered the optimism about cloud adoption (E5: 31). However, after years of experience, it became clear that some cloud deployments are exceedingly costly, failing to meet financial expectations (E5: 31). Specific cases, such as the deployment of high-performance storage systems demonstrate significant discrepancies in performance and

cost between the cloud and on-premise, as existing on-premise systems offer throughput and data transfer rates that cloud services currently cannot match without incurring substantially higher costs (E5: 101). This contrast in performance and costs underscores the necessity for organizations to assess each migration individually and calculate the business case thoroughly instead of blindly following a cloud-first strategy.

As mentioned in the previous section, the longevity of products is a special characteristic in the finance and insurance sector. This not only poses architectural challenges, but also requires understanding the long-term economic effect of shifting systems to the cloud. One expert shared an example of an AWS service which should be used by business users. After setting up the service, it turned out that it was not user-friendly towards these non-technical users without additional customization (E13: 91). However, due to the frequent updates of cloud services, customization would have required two additional engineers at SoftwareCorp just to keep up with the changes, which would have been too expensive (E13: 91). To mitigate such risks, Expert 13 stresses the importance of staying close to the cloud provider's standards:

"But it is very, very important to consider these business implications over the life cycle. Because you cannot expect the stack you have chosen to work for ten years. And for me, that is the most important point in the cloud topic. What happens if something changes, how do I deal with it? And do I have an application that can deal with it? That means I have to limit myself. What do I do in customizing? It cannot be too much. I have to be as close as possible to the product standard so that all these changes do not throw me off course" (E13: 91).

Another example was InsuCorp's experience with ServiceNow, where extensive customization had led to high costs during vendor updates (E13: 91). The lesson drawn was to critically evaluate whether deviations from the cloud provider's standard setup are necessary, advocating for minimal customization to ensure cost-effectiveness and maintainability (E13: 91).

To summarize, it is necessary to not view the cloud dogmatically as a solution for every use case, but rather assess every use case individually and understand the business case behind it. To illustrate, cloud providers offer services such as reserved instances, spot instances, and dynamic scaling options, which can be beneficial for handling variable workloads and cost management (E13: 63). However, the suitability of these options depends heavily on the specific needs of the business case, such as the necessity for real-time processing or the ability to handle sudden drops in capacity (E13: 63-65). As mentioned before, scenarios like this require a thorough end-to-end understanding of both technical as well as business aspects. To foster this understanding, either business professionals need to learn IT or vice versa (E13: 71). Agile methods can aid this process by providing more iterations and direct feedback, although communication challenges can arise from different vocabularies used by IT and business professionals (E13: 71). As IT is a service function within InsuCorp, technicians have the duty to follow a customer-centric approach to deliver value, and thus are required to also learn the business implications of their operations (E13: 71).

Table 16 recaps the challenges and best practices regarding business case orientation of cloud migrations at InsuCorp.

InsuCorp		
Success Factor	Challenges	Best Practices
Business Case Orientation	<ul style="list-style-type: none"> • In Some Use Cases, Cloud Is Less Performant and More Costly • Extensive Customization Is Costly in the Long Run • End-to-End Understanding of Technology and Business Is Complex 	<ul style="list-style-type: none"> • Not Using Cloud Dogmatically; Assessing Every Use Case Individually • Calculating Business Case Thoroughly Beforehand • Sticking Close to Standards to Minimize Long-Term Costs • Letting IT Professionals Learn Business and/or Vice Versa

Table 16: Challenges and Best Practices Regarding Business Case Orientation of Cloud Migrations at InsuCorp

Source: Own Representation

Cloud Skills Among the Workforce

As cloud adoption entails a shift towards more complex IT roles that require an end-to-end understanding of interconnected systems, InsuCorp is struggling as an insurance company to compete for skilled cloud experts in a global market. To tackle this issue, the company mainly relies on training and further education.

Finding experienced cloud experts poses a major challenge to InsuCorp. On the one hand, the adoption of cloud technology leads to a workload reduction for IT professionals, as some tasks are taken over by the cloud provider, especially when switching to SaaS (E5: 65). This involves simple operating jobs like monitoring storage systems (E5: 67). Further, the need for traditional physical tasks associated with on-premise data centers like managing cables, racks, and air conditioning decreases (E5: 79). On the other hand, the roles that remain require orchestrating the system landscape with an end-to-end understanding (E5: 65). Expert 5 gives an example of how the IT roles change due to cloud adoption:

“So, yes, there are savings, but that usually has something to do with dull operator jobs [...] let's take an example. When I started, you still had storage systems as a department. And then the storage systems were in some room and then you had storage operators who did nothing other than stare at screens all day and night to see whether the storage on the hard disk was overflowing or whether it was overheating or whether it was somehow milling itself. That is all gone because it is now either automated at Microsoft or whatever. Instead, you have really highly qualified people who keep an eye on the entire system” (E5: 67).

The end-to-end understanding required for the remaining roles can only be gained by multiple years of working experience in different cloud aspects and projects, for example cloud storage-, system-, and network engineering (E5: 65, 69). Experienced professionals with such capabilities are extremely rare (E5: 65). Additionally, these experts demand high salaries (E5: 67), which the company typically does not pay due to inflexible way in which their salaries are structured (E5: 67, E13: 81). Expert 13 (75) shared that he tried to fill a position for two years and ultimately gave up. Further, the expert observes that modern workers often prefer to specialize in specific segments of technology rather than take a holistic approach (E13: 75).

This specialization limits their ability to handle comprehensive roles that require understanding the full stack (E13: 75).

Overall, jobs are more complex in contrast to past times (E13: 77). This difficult situation for employers is exacerbated by the current employee's market (E13: 77-79), which allows potential employees to have high expectation of employers, for instance regarding salary and working time (E17: 47-49). Further, InsuCorp struggles to compete for skilled IT professionals as an insurance company, because the potentials employees are more attracted by technology companies like Google, Amazon, or Microsoft (E17: 49). Additionally, IT jobs today often are independent of the geographical location of the worker and employers. Skilled workers demand comparable salaries regardless of their location and are often attracted to higher offers from large international corporations, particularly American ones (E13: 81). This creates a highly competitive environment for InsuCorp as a German insurance company with rather inflexible salary options (E5: 67; E13: 81; E17: 49). This lack of skilled cloud experts leads to a slower progress in the firm's cloud transformation and sometimes even blocks the day-to-day work (E17: 47).

InsuCorp addresses this issue through a wide range of training possibilities. This includes both in-house and external options, for example LinkedIn Learning, Udemy, and even formal education such as pursuing additional bachelor's or master's degrees (E17: 67). Expert 17 (65) praises the open culture of upskilling at InsuCorp, stressing that every kind of training is supported by the management.

Table 17 summarizes the challenges and best practices that concern the cloud skills among InsuCorp's workforce.

InsuCorp		
Success Factor	Challenges	Best Practices
Cloud Skills Among the Workforce	<ul style="list-style-type: none"> • Shortage of Skilled Cloud Experts • Cloud Requires Experts With End-to-End Understanding, Which Are Rare • Global Competition for Professionals; Hard to Compete With Salaries as an Insurance 	<ul style="list-style-type: none"> • Learning Interconnected Thinking by Working in Various Departments • Supporting Every Kind of Training • Being More Flexible in Job Offerings

Table 17: Challenges and Best Practices Regarding the Cloud Skills Among the Workforce at InsuCorp

Source: Own Representation

Approach Towards Cloud Migration Projects

Challenges regarding the approach towards cloud migration projects at InsuCorp encompass inefficient top-down initiatives, underestimating the effort required for such projects and a board that does not embrace agility. These challenges can be mitigated by building minimum viable products (MVPs) to identify road blockers early, working agile at the implementation level and sticking to proven project management tools.

Starting cloud migration projects top-down represents an inefficient approach. Many migration endeavors at InsuCorp are often initiated top-down at the Holding-level in cooperation

with strategic consultants like BCG and McKinsey, specifying which new tools to use, for example (E5: 49). However, this top-down approach is slow and inefficient, as the consultants produce lots of abstract presentation slides, which are not helpful at the operational level (E5: 53). A more efficient approach would be to build prototypes and MVPs fast, learn from these, and then go further, as this approach allows identifying critical road blockers of a project early (E5: 53; E13: 91). In contrast, strategy consultants should be used for describing the overall strategic direction of the company and the insurance market, but they should not prescribe specific tools, as this type of recommendation is often far from practice (E5: 47). At the operational level, it is more valuable to adopt the best practices of other companies to learn from their experiences (E5: 47).

Migrating tools is often more complex than initially thought. In many migration projects, the effort is underestimated (E5: 95). This underestimation pertains not just to the coding effort but also to addressing technical complexities, such as differences in data formats, character encoding issues (e.g., UTF-8), and other technical details (E5: 95). Moreover, existing automation tools are not yet capable of fully addressing these migration challenges, and current artificial intelligence technologies do not significantly contribute to such projects (E5: 95).

A typical cloud migration project at InsuCorp is a hybrid of waterfall and agile methodologies. Convincing upper management to embrace an agile approach is challenging because the executives want to know precise completion dates (E5: 85). As a result, while the teams actually concerned with the implementation work in an agile manner, employing methods like Scrum and Kanban, this agile workflow is often communicated to top management in a more traditional, waterfall-style timeline using classic presentation slides and Gantt charts (E5: 85-87). This dual approach allows operational teams the flexibility of agile methodologies while providing the board with the predictability and structured oversight they require.

Tracking the progress of cloud migration projects at InsuCorp is done with the same project management tools as any other IT projects. To illustrate, InsuCorp uses Jira to manage backlogs, epics, stories, and tasks of migrations, without any special tools or frameworks unique to cloud projects (E5: 89-91).

Table 18 presents an overview of the challenges and best practices that relate to the approach towards cloud migration projects at InsuCorp.

InsuCorp		
Success Factor	Challenges	Best Practices
Approach Towards Cloud Migration Projects	<ul style="list-style-type: none"> • Approaching Migrations Top-Down Is Inefficient • Underestimating Migration Effort • Board Does Not Embrace Agility 	<ul style="list-style-type: none"> • Starting Projects Small and Building MVPs • Identifying Road Blockers Fast • Working Agile at the Implementation Level, While Reporting in Waterfall Manner • Managing Cloud Projects Like Any Other IT-Projects (e.g., with Jira)

Table 18: Challenges and Best Practices Regarding the Approach Towards Cloud Migration Projects

Source: Own Representation

6.2.3 Case Summary

The case analysis of InsuCorp's cloud transformation shows that the special characteristics of the finance and insurance sector, combined with the international scope of the enterprise, significantly influence the company's migration initiatives. Regulatory requirements in different countries require specific adaptations to cloud services, as the cloud vendors do not provide compliance out of the box (E13: 18). Furthermore, the inherent longevity of insurance products introduces additional complexities. On the one hand, the company needs to migrate legacy systems designed many years back when such long-standing products were established, yet these migration projects do not create new revenues, as they solely keep those products alive (E13: 20). On the other hand, InsuCorp needs to stick to standard functionalities offered by cloud providers to ensure future compatibility of long-lively products without changing the technology stack over and over (E13: 39). This scenario is further challenged by InsuCorp's heterogeneous system landscape, resulting from numerous acquisitions, and an international setting with divergent regional regulations (E5: 39), which poses challenges to achieving a harmonized system landscape. To overcome such obstacles, InsuCorp needs to minimize costly exceptions to global architecture blueprints and assess the long-term business implications of migration projects.

While most of the issues described in the case analysis are cloud-induced, some challenges are not exclusive to the cloud context. For example, InsuCorp faces a shortage of cloud experts (E5: 65; E13: 75; E17: 47), however, continuing to rely on legacy systems in the future would confront the company with the risk of finding experts for such outdated technologies, which often are implemented in programming languages that are rarely taught at universities anymore (E13: 20-28). Consequently, sourcing specialists capable of maintaining such systems could soon prove more challenging than recruiting cloud experts.

To summarize, cloud transformation is especially challenging for InsuCorp as a globally operating enterprise in an industry characterized by regulation. To achieve a successful transformation, this setting requires a thorough understanding of business implications to assess whether a given use case is suitable for the cloud. Insights gained from this case analysis can serve as valuable lessons for other organizations in similar industries, demonstrating that while cloud transformations can offer significant benefits, they require careful planning to realize their full potential.

Appendix E.2 consolidates all success factors, challenges, and best practices identified at InsuCorp into a single table.

6.3 Case 3: ServiceNow Migration at SoftwareCorp

6.3.1 Case Introduction

SoftwareCorp is a major player in the global software industry. The company is based in Germany and was originally known for its integrated business management software. Over time, SoftwareCorp has expanded its product portfolio, including data warehousing, business analytics, and financial services, for example. The company offers both on-premise and cloud

versions of many of their products. Thus, SoftwareCorp itself is a cloud provider in the global market.

The case of SoftwareCorp is different from the case of InsuCorp and MediaCorp, as the analysis does not focus on a general cloud transformation of the company. Instead, the case analysis discusses the migration of a specific system at SoftwareCorp, namely the adoption of ServiceNow, a cloud-based PaaS solution for automating and managing processes. ServiceNow was originally known for its IT service management capabilities but has since expanded to offer a wide range of automation services including human resources and customer service, for example. Prior to the ServiceNow migration, SoftwareCorp used an in-house on-premise system for service management (E7: 19).

The choice to migrate from the in-house on-premise system to ServiceNow was not primarily influenced by the product being cloud-based, but rather by its capabilities (E7: 19, 21; E20: 21). With the self-developed on-premise system approaching end of life, an evaluation for a potential successor solution was prompted (E8: 19). ServiceNow's positioning in the Gartner Magic Quadrant as a leading solution for IT service management was a main factor for SoftwareCorp to adopt this system (E18: 25). The fact that SoftwareCorp aspires to be a cloud company regarding the products they offer their customers and generally accepts cloud software for third-party tools added a secondary benefit to choosing ServiceNow (E7: 19; E18: 25).

The primary policy at SoftwareCorp is to run in-house software wherever possible, meaning priority is given to using their own solutions internally over external software (E18: 27; E20: 21). When offering their products to customers, there is a push towards developing cloud solutions (E7: 19; E18: 27; E20: 21). When it comes to external software like ServiceNow, there is no clear directive by the board to favor cloud services (E18: 27). Still, more and more applications are shifted to the cloud (E7: 23; E8: 23, 25; E20: 21, 23)

The ServiceNow migration at SoftwareCorp started in 2019 (E20: 17). Internally, SoftwareCorp is structured into Lines of Business (LOBs), which represent the major product areas that they sell to their customers (E18: 32-33). Currently, SoftwareCorp has started the onboarding process to the ServiceNow platform for 15 of these 21 LOBs (E7: 77). Depending on the line of business, the progress in onboarding ranges roughly from 40% to 80% (E18: 31). The decision to adopt ServiceNow was a top-down decision by the board (E20: 33). The scope of the ServiceNow adoption at SoftwareCorp is enterprise-wide, as it affects the entire product landscape and has around 20.000 daily users (E20: 25).

6.3.2 Socio-Technical Success Factors, Challenges and Best Practices at SoftwareCorp

Success factors for the ServiceNow migration at SoftwareCorp encompass the relationship and communication with ServiceNow, the attitude towards the system as an external solution, skills, and knowledge of the platform among the workforce, the establishment of a ServiceNow Center of Excellence (CoE), and process harmonization.

Relationship and Communication With ServiceNow

For SoftwareCorp, challenges arise due to a) less insights into ServiceNow's cloud system compared with in-house solutions, and b) being one of ServiceNow's largest customers, often pushing the system to its boundaries. These challenges necessitate effective communication and a relationship of mutual benefit between the two software vendors.

One challenge is the loss of control and insight into system operations (E8: 60; E20: 59), which complicates the analysis of incidents. For example, there was an incident where an unexpected reindexing occurred due to a change at ServiceNow's data center, which was not immediately visible to their operations team (E20: 59). This lack of visibility and control is contrasted with the transparency SoftwareCorp has with on-premise solutions, which allow for deeper insights into backend processes, including direct interactions with product engineers and a more thorough understanding of the system's internals (E20: 59). Overall, monitoring in the cloud is not as straightforward as on-premise (E8: 60). Expert 8 (60) also suggests that incidents due to human error are easier to handle in-house, as the cloud provider will try to fog mistakes towards the customer. These challenges highlight the reduced operational control and monitoring capabilities SoftwareCorp must acknowledge when utilizing a cloud solution like ServiceNow.

Furthermore, when incidents occur, SoftwareCorp is heavily reliant on ServiceNow's customer support, which can require to follow up on an agent multiple times before the cloud provider starts to search for the root cause in his own data centers (E20: 59). While SoftwareCorp is one of ServiceNow's largest clients, which theoretically should mean their issues receive more attention, this is not always practically beneficial. Their position as a frontrunner often pushes the cloud provider's system to its limits, encountering problems that the ServiceNow developers had not anticipated (E20: 61). When such issues occur, SoftwareCorp needs to find workarounds quickly instead of waiting until ServiceNow provides a formal solution (E20: 61).

Especially in the early phase of the ServiceNow migration, another challenge was the terminology used in discussions with ServiceNow, which initially led to misunderstandings (E8: 39). To illustrate, technical terms like *ticket* or *incident* were used in different ways at SoftwareCorp and ServiceNow. However, over the years, they have established a mutual understanding of terminology, facilitating smoother communication.

Since the start of the migration project, SoftwareCorp and ServiceNow have established a relationship of mutual benefit, as not only SoftwareCorp is a customer of ServiceNow but also vice versa (E7: 19; E18: 35). While there might be potential conflicts, especially in aligning a European company's processes with an American product, SoftwareCorp's close relationship with ServiceNow's business unit helps mitigate these issues (E7: 27). This partnership allows for a give-and-take dynamic where they can influence ServiceNow's offerings, such as addressing data protection and GDPR compliance, which ServiceNow has been receptive to and has integrated into subsequent releases (E7: 27). Additionally, sometimes there is the urgent need for SoftwareCorp to develop custom solutions which later are incorporated by ServiceNow (E7: 27). However, it is noteworthy that ServiceNow is also a competitor for SoftwareCorp in certain areas, for example regarding human resources and finance software (E18:

35). This competitive situation prevents SoftwareCorp to fully adopt the ServiceNow service portfolio (E18: 35).

Table 19 depicts a summary of the challenges and best practices that concern the relationship and communication between SoftwareCorp and ServiceNow.

SoftwareCorp		
Success Factor	Challenges	Best Practices
Relationship and Communication With ServiceNow	<ul style="list-style-type: none"> • Less Control, Insight, and Monitoring in the Cloud • Being Dependent on ServiceNow's Support Agents • Being a Frontrunner Pushes ServiceNow Platform to Its Limit <ul style="list-style-type: none"> • Different Terminology Than ServiceNow • ServiceNow Is Both Customer and Competitor 	<ul style="list-style-type: none"> • Following up on ServiceNow's Support Constantly • Establishing a Relationship of Mutual Benefit With ServiceNow • Developing Workarounds Instead of Waiting for Formal Solution by ServiceNow • Letting ServiceNow Incorporate Custom Solutions

Table 19: Challenges and Best Practices Regarding the Relationship and Communication with ServiceNow

Source: Own Representation

Attitude Towards ServiceNow as an External Solution

At SoftwareCorp, resistance towards ServiceNow stems from the prevailing culture of favoring in-house development over external solutions, skepticism towards cloud solutions, especially from older employees, and overlapping capabilities of the system with in-house tools. To address these issues, the company tries to accompany the employees, for instance by giving them time to adapt and clearly communicating the benefits of ServiceNow.

SoftwareCorp is facing employee resistance to adopting ServiceNow, rooted in the corporate culture. Expert 18 describes the attitude of some employees towards ServiceNow as follows:

“The second thing I still observe, even after five years: There is still a strong not-invented-here-syndrome at SoftwareCorp. ‘Why didn’t we build it ourselves? Why don’t we have our own solution as a proud software house versus a third-party software like ServiceNow’” (E18: 35).

Expert 20 shares this observation, stressing that the average SoftwareCorp employee views himself as a software developer and favors own solutions:

“[...] the average SoftwareCorp employee sees himself as a software developer and they always think to themselves: ‘Why don’t we use something of our own? Why don’t we have our own tool?’ And that is a bit of a basic vibration that resonates everywhere. ‘Why do we, SoftwareCorp, the big German software company, have to invest so many license costs in another company, because we could do so much better ourselves?’ So, I think that is a basic attitude that resonates a bit” (E20: 35).

Other experts identified a demographical pattern among these concerns. On the one hand, younger developers view the transition to ServiceNow as an exciting challenge and an oppor-

tunity to gain unique expertise on a new platform, enhancing their career prospects potentially outside the company (E7: 49). On the other hand, long-term developers are less enthusiastic about working with ServiceNow (E7: 49; E8: 45). This group tends to see the shift as a contradiction, especially in a company that promotes the paradigm of running own software wherever possible, but then opts to integrate an external solution like ServiceNow (E7: 49).

These observations are supported by an internal survey, which revealed that employees who are relatively new to the company tend to be more satisfied with using ServiceNow, while longer-serving employees, particularly those based in Germany, show greater dissatisfaction (E18: 39). This dissatisfaction is partly due to these employees having a deeper history and possibly more attachment to the company's legacy systems (E18: 39). Additionally, employees who use the software less frequently are generally less satisfied compared to those who use it daily, such as support staff, who are more content once they acclimate to the system's complexity (E18: 39). The survey indicated that the initial overwhelming range of functionalities could lead to an information overload for less frequent users (E18: 39).

Adding up to this general resistance against external solutions, one expert also supposes that older employees tend to be more skeptical specifically about cloud technologies compared to their younger counterparts (E20: 41). They are historically accustomed to on-premise environments, where they have higher control and responsibility over the systems (E20: 45). Conversely, adopting cloud solutions involves relinquishing certain tasks and responsibilities to the service provider, which can be viewed as either a loss of autonomy or a relief from the burden of managing certain IT functions (E20: 45). Expert 20 (45) notes that this perspective depends on how one chooses to see the role of the service provider.

There are also "political" motivations for the resistance against the migration when ServiceNow's capabilities overlap with those of in-house tool. To illustrate, one employee who oversees such an in-house tool often criticizes ServiceNow as being slow and having bad performance (E20: 47). This tool, part of an alerting framework from the operations and monitoring sector, generates notifications for certain system events - a functionality also provided by ServiceNow (E20: 47). The colleague, in an effort to promote his preferred tool, has made claims about ServiceNow that were proven false upon inspection (E20: 47).

Finally, subjective performance issues exacerbate the resistance against ServiceNow. The cloud-based nature of ServiceNow entails that traffic is managed through primary and secondary data centers and load balancers distributing requests across multiple nodes (E20: 37). This setup complicates operational monitoring and can lead to perceived performance disparities among users, depending on the node they are connected to (E20: 37). Such issues contribute to the impression of inadequate performance, even though the overall system is performant (E20: 37).

To address these concerns, the company has invested heavily in change management, communication, and onboarding processes when transitioning units from old software to ServiceNow. This includes creating learning maps, producing instructional videos on new features, and writing comprehensive documentation that details both the standard processes and their implementation within the ServiceNow environment (E18: 37). Additionally, selected power users participate in testing and rollout phases to facilitate smoother transitions (E18: 37).

However, Expert 18 notes that it is hard to address concerns individually, as the annual user experience survey they employed is anonymous (E18: 37).

Still, SoftwareCorp leverages the insights from this survey to designing role-specific interfaces (E18: 39). This approach tailors the software's functionalities to meet the distinct needs of different user groups, ensuring that each user receives relevant information necessary for their tasks without the clutter of unnecessary features (E18: 39). This targeted strategy aims to enhance efficiency and satisfaction by simplifying interactions with the software for various roles within the company.

However, SoftwareCorp acknowledges that the frequent updates native to cloud technologies are challenging to users. While constant change can be inconvenient, it is a necessary and beneficial aspect of modern technology, as otherwise a lack of innovations and improvements would dissatisfy users even more (E18: 61). Overall, users must accept the fact that modern technologies like cloud computing entails more responsibility to constantly adapt to changes.

Giving employees time to adapt to the new technology and removing their fears is important at SoftwareCorp. As some employees are having concerns about job security as more functions move to the cloud, it is important to understand that the coordination and monitoring demands within the company actually increase, contrary to fears that jobs might be eliminated (E8: 60). This shift requires a change in mindset from managing everything internally to overseeing external services, which includes ensuring the continuous performance and security of the cloud services (E8: 60). Expert 20 also states that communicating the value and reasons behind the migrating is an essential task in managing such a change:

“[...] but at the end of the day you are still working with people and you always have to communicate, that is key. It is very surprising to me that talking to people and communicating things is so essential, and I don't think you should forget that you have to get across and explain why it makes sense, why we should do this migration and get that across” (E20: 67).

Further, forcing employees to work with the new system is counterproductive and tends to increase resistance. Instead, personalized approaches are necessary, such as one-on-one conversations to identify aspects of the change that an employee might still be willing to accept and to address individual concerns directly (E8: 47). It is noteworthy that in such a large enterprise, there are always opportunities for those who are resistant to change to find other roles within the organization (E8: 47). Additionally, as long as the ServiceNow migration is not finished, SoftwareCorp still maintains its old infrastructure alongside ServiceNow. This allows managers the flexibility to keep employees who are resistant to change on the old systems while gradually integrating ServiceNow and its functionalities (E7: 55). Such possibilities respects employees' preferences and mitigate dissatisfaction.

Table 20 gives an overview of the challenges and best practices related to the attitude of SoftwareCorp's staff towards ServiceNow.

SoftwareCorp		
Success Factor	Challenges	Best Practices
Attitude Towards ServiceNow as an External Solution	<ul style="list-style-type: none"> • "Not Invented Here" Attitude Towards ServiceNow • General Skepticism of Older Employees Against Cloud • Politically Motivated Resistance When ServiceNow Overlaps With In-House Tools • Occasional Performance Issues for Individual Users 	<ul style="list-style-type: none"> • Employing Change Management and Communicating Extensively • Adapting UIs to User Groups to Avoid Information Overload • Giving Employees Time to Adapt and Address Their Fears • Communicating the Value of the Migration • Not Forcing Employees; Allowing to Switch Job Internally; Letting Resistant Employees Manage Old System That Runs in Parallel

Table 20: Challenges and Best Practices Regarding the Attitude Towards ServiceNow as an External Solution

Source: Own Representation

Skills and Knowledge of ServiceNow Among the Workforce

SoftwareCorp faces challenges with initially limited internal knowledge of ServiceNow's platform, difficulties in recruiting experts, and constraints on training young professionals. To mitigate these issues, the company hires external service providers for development tasks, learns from their expertise, and strives to retain key roles in-house to preserve critical knowledge.

Initially, the migration began smoothly because SoftwareCorp hired an external service provider with sufficient resources for the bulk of development work on the ServiceNow platform (E18: 53; E20: 57). Now the strategic approach of the company is to keep key roles and stakeholders within the company to ensure that crucial knowledge remains in-house (E20: 57). This involves positioning internal employees in critical positions such as area product owners, architectural roles, and process leads to maintain operational expertise even after external consultants depart (E20: 57). However, ServiceNow experts are in high demand globally, and although the company has managed to build a competent team over the last years, including a group of 20 developers in China, there is a persistent challenge in recruiting new personnel familiar with ServiceNow (E8: 59). While SoftwareCorp aims at recruiting experienced professionals, the market mostly offers newcomers, which is not ideal since the company does not have the resources to conduct extensive training (E18: 53). This scarcity of experienced professionals could potentially slow down the migration process if internal staffing needs are not met.

External service providers play a crucial role in the ServiceNow migration, particularly in facilitating onboarding and providing implementation support. These external consultants were engaged not only for their expertise in development but also to provide a comprehensive understanding of the platform's capabilities, often assisting in pair-programming and advising SoftwareCorp's staff (E7: 45). While the external consultants helped with immediate project needs, internal team members simultaneously underwent certification processes to ensure that critical skills were developed in-house (E7: 47). This dual approach ensured that Soft-

wareCorp built internal competencies in key areas like the architecture of ServiceNow, enabling them to manage the new systems independently of external partners in the future.

Training and certification play an important role to ensure employees are comfortable with ServiceNow. Training methods include online courses, training on-the-job and pair-programming, often facilitated by consultants with ServiceNow expertise (E7: 57). Additionally, ServiceNow also offers online training courses next to the certifications the platform requires to operate as an architect (E7: 47, 57).

Table 21 recaps the challenges and best practices regarding the skills and knowledge of ServiceNow at SoftwareCorp.

SoftwareCorp		
Success Factor	Challenges	Best Practices
Skills and Knowledge of ServiceNow Among the Workforce	<ul style="list-style-type: none"> • Initially Little Internal Knowledge About ServiceNow <ul style="list-style-type: none"> • Hard to Recruit ServiceNow Experts • No Resources to Train Young Professionals 	<ul style="list-style-type: none"> • Hiring External Service Provider for Development • Keeping Key Roles in the Company • Learning From External Service Providers • Leveraging a Wide Range of Training Possibilities

Table 21: Challenges and Best Practices Regarding Skills and Knowledge of ServiceNow Among SoftwareCorp's Workforce

Source: Own Representation

Establishment of a ServiceNow Center of Excellence

At SoftwareCorp, the ServiceNow CoE faces the challenge of onboarding various lines of business, each with its own set of demands within a complicated system landscape. To address this, the CoE employs change management practices and a program management to prioritize these demands effectively.

SoftwareCorp established a ServiceNow CoE, which plays an important role in managing the migration project. The CoE is primarily responsible for driving and managing the ServiceNow migration (E20: 55). This organizational entity is composed of various units, including a change management team that is responsible for onboarding the various lines of business to the ServiceNow platform (E20: 55). There are also individual product streams, which focus on specific areas like customer tickets and knowledge base articles, or incidents and problems, each managed by dedicated development units (E20: 55). Additionally, the CoE encompasses an operational team tasked with system monitoring, as well as several staff positions, for example in areas like security (E20: 55).

Finally, another key unit of the CoE is the program management team, which prioritizes demands from the business units, as there are often many requests but limited resources (E20: 55). Due to the complex system landscape with over 200 active integrations (E20: 13), managing the demands and expectations of various units in this network is challenging, as many requests have to be rejected to keep the balance between what is technically feasible and what is practical (E20: 13). For instance, when a team requested real-time updates for all incidents, there were discussions whether it is feasible to handle around 30,000 updates per day in the

system (E20: 13). Managing such demands often involves navigating organizational politics and explaining why certain technical requests may not be practical, thus highlighting the complex dynamics of demand management in a large-scale IT environment (E20: 13).

Table 22 summarizes the challenges and best practices that the ServiceNow CoE faces at SoftwareCorp.

SoftwareCorp		
Success Factor	Challenges	Best Practices
Establishment of a ServiceNow Center of Excellence	<ul style="list-style-type: none"> • Accompany Lines of Business in Onboarding <ul style="list-style-type: none"> • Complexity of Integration Landscape • Many Demands But Only Few Resources 	<ul style="list-style-type: none"> • Change Management Unit to Onboard Lines of Business • Program Management Unit to Prioritize Demands

Table 22: Challenges and Best Practices Regarding the ServiceNow Center of Excellence at SoftwareCorp

Source: Own Representation

Process Harmonization

Over the years, StanCorp's many acquisitions and diverse business units have created a set of divergent processes. Nonetheless, the company has created a culture of viewing large migration projects like the ServiceNow integration as a chance to rethink existing processes.

SoftwareCorp views the ServiceNow migration as a chance to harmonize its processes and cut off outdated practices. Various acquisitions in the past years led to a heterogenous set of customer support channels (E20: 53). One primary goal of the ServiceNow adoption is to harmonize these channels to achieve a smoother user experience by streamlining them into a single, unified support solution (E20: 53). Expert 7 describes this situation as follows:

“If you want to bring 21 different lines of business onto one platform, which may have previously been very divergent, still with their old infrastructure, [...] then process harmonization is a very, very important part. And everyone has to more or less follow suit. And as soon as the word *cloud* is mentioned, the business and the requesters also understand that you have to harmonize” (E7: 29).

However, while there is an understanding for the need for harmonization, it is still challenging in such a large enterprise, as many units are resistant to change because they are accustomed to their own processes and are reluctant to adapt to new methods (E18: 65; E20: 65). Overcoming this resistance involves substantial effort in change management, involving extensive discussions and negotiations to find a middle ground. This process demands not only technical adjustments but also substantial collaboration and coordination to align disparate processes into a coherent, organization-wide standard (E20: 65). Expert 18 (65) stresses the importance of having a strong mandate from the top management to enforce changes successfully, as otherwise various units will persistently resist to the change and defend their old ways of working.

To evaluate and redesign the existing processes, SoftwareCorp employs both internal process leads and external process consultants. Process Leads are responsible for owning, defining, and documenting specific process segments to meet standards such as ISO 9001 and 9002, ensuring that internal workflows are thoroughly outlined (E18: 49). They also ensure that essential operational insights are incorporated into the new system (E7: 33). However, as these process leads were unfamiliar with ServiceNow, external process consultants were brought in for their expertise (E18: 49). Additionally, their neutral perspective is beneficial in convincing internal staff to rethink the existing processes (E7: 33). This collaborative approach allowed to educate internal units and gradually merge both the internal and external roles over time with increased knowledge (E18: 49).

Table 23 presents an overview of the challenges and best practices that concern process harmonization at SoftwareCorp.

SoftwareCorp		
Success Factor	Challenges	Best Practices
Process Harmonization	<ul style="list-style-type: none"> • Many Divergent Processes, Especially Due to Acquisitions • Every Unit Is Accustomed to Their Own Process and Unwilling to Change 	<ul style="list-style-type: none"> • Rethinking, Simplifying and Harmonizing Existing Processes • Cutting off Outdated Practices • Mandate From Top Management • Employing Internal and External Process Consultants

Table 23: Challenges and Best Practices Regarding Process Harmonization at SoftwareCorp

Source: Own Representation

6.3.3 Case Summary

The ServiceNow migration at SoftwareCorp presents a unique setting that distinguishes it from typical implementations of the PaaS solution for three reasons. First, as a major player in the IT and software industry, SoftwareCorp possesses significant technical expertise and communicates with ServiceNow at a deeper technical level than average customers (E8: 39). Second, SoftwareCorp is one of ServiceNow's largest customers, often pushing the platform to its boundaries (E20: 61). Third, there is a unique dynamic between the organizations, as not only is SoftwareCorp a customer of ServiceNow, but also vice versa (E18: 35). Additionally, in some areas, they even are competitors (E18: 35).

The case analysis has shown that this special setting entails both advantages and disadvantages for the migration initiative. For instance, on the one hand, the corporate culture at SoftwareCorp's is characterized by favoring in-house development over buying external solutions due to the high technical expertise, which results in skepticism and resistance of many employees against the ServiceNow migration (E18: 35; E20: 35). On the one hand, this expertise allows them to develop workarounds and extensions to the platform when they stretch it to its operational limits (E20: 61). Often, these adjustments are then incorporated by ServiceNow in a subsequent release, which represents the mutually beneficial partnership the two companies share (E7: 27). However, they are also competitors in certain product categories,

which hinders SoftwareCorp from leveraging the full capabilities of ServiceNow (E18: 35). To summarize, it is important for SoftwareCorp to be aware of these circumstances, which both challenge and benefit the migration, to successfully navigate the project.

The case analysis of SoftwareCorp's ServiceNow migration further reveals that while some challenges are cloud-specific, others are common to traditional IT migration projects. For instance, developing in-house expertise and conducting employee training would also be necessary if ServiceNow was deployed as an on-premise version. In contrast, the relationship and communication between SoftwareCorp and ServiceNow are shaped by the cloud context, as SoftwareCorp faces reduced insights, control, and monitoring capabilities compared to an on-premise system (E8: 60; E20: 59). Furthermore, especially for older employees at SoftwareCorp, the ServiceNow migration necessitates a mindset change, as they typically are historically accustomed to on-premise software and its management and are now required to give up control (E20: 41, 45). Overall, the case analysis has shown that on the one hand, some challenges in a cloud migration project mirror those encountered in traditional IT projects, allowing the application of proven best practices. On the other hand, the migration also presents novel challenges unique to cloud environments, necessitating awareness of these challenges and the development of best practices to address them.

Appendix E.3 consolidates all success factors, challenges, and best practices identified at SoftwareCorp into a single table.

6.4 Insights From Remaining Interviews

Six interviews conducted during this thesis are not included in the cases described in the previous sections. This exclusion is due to two reasons: in some instances, it was either not possible to find additional interview partners within the respective organizations, or it turned out that the organizations were still in the planning phase of the cloud adoption and had not yet started the implementation. Nevertheless, this section touches upon these interviews, as they provide additional socio-technical aspects in comparison to the cases of MediaCorp, InsuCorp and SoftwareCorp. For instance, I conducted an interview with an expert working at an IT service provider whose strategic goal is to increasingly offer its products and services as cloud solutions, such as SaaS. Additionally, I conducted two interviews with experts at a German public administration, which has a very different set of requirements for cloud adoption compared to private companies like MediaCorp, InsuCorp, and SoftwareCorp.

6.4.1 Cloud-Induced Cultural Shifts at an Aerospace Company

One interview at a company in the aerospace sector revealed cloud-induced cultural changes in the organization. The company primarily leverages cloud computing within administrative functions such as Buying and Human Resources (E1: 21). Expert 1 (51) highlighted the diversity of the company's workforce, which includes a wide range of experience levels from employees who have dedicated fifty years to the company to recent graduates. Additionally, the workforce encompasses a variety of roles from manufacturing workers to highly specialized roles in aerospace engineering, where colleagues with multiple PhDs are shaping the future of the industry (E1: 51). This diversity presents a challenge in meeting the varying demands and preferences towards IT and modern work environments (E1: 51). The shift to modern cloud

software, such as Microsoft Teams, exemplifies this challenge. Long-standing employees may struggle with new technologies and require extensive guidance, whereas younger employees adapt quickly without much assistance (E1: 51). As a result, the company needs to establish a culture where employees take on more responsibility, adapt quickly to changes, and are intrinsically motivated to engage with new tools (E1: 51). Unlike in the past, where software interfaces remained static until the next major update, modern cloud applications frequently change, requiring users to adapt continuously (E1: 51). Expert 1 reflects on this cultural shift as follows:

“And finding a middle ground is actually incredibly difficult for the culture. I believe that the culture has already changed in such a way that more responsibility has been transferred to the employee, an employee must be more intrinsically motivated to deal with the issues and must be much more flexible” (E1: 51).

To address these challenges, the company offers many training resources. To illustrate, for the integration of Microsoft Teams they created short instructional videos, held online meetings, and offered traditional classroom-style training sessions to accommodate the diverse learning preferences of their workforce (E1: 53). The effectiveness of these efforts remains to be seen, but the goal is to accompany all employees in the journey to the cloud.

6.4.2 The Transformation of an IT Service Provider Towards a Cloud Company

The interview with Expert 2, who led a company-wide cloud transformation project, provided valuable insights into the transition of the enterprise from a traditional IT service provider to a cloud company. The software vendor is strategically positioning itself in the market as a cloud provider, with a particular focus on expanding its SaaS offerings.

With the shift towards offering cloud-based solutions to its customers, the company faces significant operational and strategic changes. For instance, the transition from traditional software development to a SaaS solutions introduces complexities in value chains, requiring continuous management of software operations and maintenance (E2: 17). Further, such a change entails new skills and roles, especially for those in service and sales positions who must understand and articulate the functionalities and advantages of cloud services to engage customers (E2: 17). For example, sales personnel previously focused on on-premise solutions, encounter challenges due to a lack of familiarity with cloud technologies (E2: 17). A strategic challenge lies in persuading traditional, business-oriented managers that cloud computing is not just one of the many new technologies in the IT sector, but rather represents a significant shift in the company’s business model (E2: 29). As Expert 2 reflects on the success of the transformation project, he argues that cloud adoption impacts the business model of the software vendor in a major way:

“I often heard: ‘Cloud is just another technology, client-server, we’ve already had all that’. So simply understanding that the cloud is first and foremost a business issue and that it has far-reaching consequences for everyone in a company, and not just for those developing something in the basement, that the value chains are suddenly changing, that completely new business models are emerging with all these as-a-service business models, that you are then also responsible for operations, and simply

“creating an understanding of this in the first place, I would describe that as a success” (E5: 101).

The expert further emphasized the difficulty in providing a clear roadmap at the outset of the project, given the uncertainty about specific outcomes, such as departmental restructurings or obsolete employee’s skills (E2: 65). The company engaged in communication and internal marketing efforts like roundtables and roadshows across various locations to create awareness and manage the change among employees (E2: 65).

In summary, the insights from Expert 2 highlight the impact of cloud adoption on traditional business models of software vendors, and the importance of ensuring that all stakeholders are aligned and committed to the new direction.

6.4.3 Public Cloud Adoption at a German Public Administration

Two interviews with experts (E10 and E16) from a German public administration unveiled the special requirements and challenges that an organization in the public sector faces. Since 2016, the administration is running a well-performing private cloud, which they manage entirely in-house (E10: 16, 18; E16: 12-18). The organization is now planning to significantly increase its public cloud usage (E16: 16, 22). As of now, they are in the planning phase of the cloud transformation project but have not started the implementation yet (E10: 28-30). The major reason for the administration to invest in public cloud usage in the future is to address the anticipated personnel reduction over the next years due to retirements (E10: 24). This demographic shift is expected to lead to many unfilled positions (E10: 24). In addition, it is hard to compete for talents with the private sector, as the administration is unable to offer equally high salaries (E16: 28). As a result, there is a need to reduce the workload on the staff. The plan is to tackle this problem with adopting public cloud services, which allow for automation, digitalization, and purchasing software that is currently developed and operated in-house, off-the-shelf (E10: 24, 26).

For the administration, accepting that public cloud services can be used in a way that complies with data protection laws requires a change in the prevailing mindset (E10: 108). According to Expert 10 (108), many public administrations are hesitant towards implementing such services due to data protection and security concerns, especially if they are offered from American service providers. To achieve this mindset shift, persistent and targeted communication is necessary to convince the responsible parties (E10: 108).

Among regular employees, there is no outright resistance to cloud usage (E16: 52). Instead, many are not fully aware of the risks and potential security issues related to using internet-based cloud services (E16: 52). A specific example is the use of online translation tools like DeepL or Google Translate to translate certificates, which can expose sensitive data online, posing security and privacy risks (E16: 52). These employees prefer the speed and language range of online translators over slower, human-based translation services that the organization provides, which may take several weeks to translate documents (E16: 52).

Among the IT workforce, there exists a mixed attitude towards the cloud. Employees from the general workforce who move into IT bring a conservative and cautious approach, reflecting

the overall culture of the agency, which is typically reserved and slow to adopt new technologies (E16: 52). On the other hand, there are many external IT service providers who prioritize flexibility and rapid solutions, possibly at the expense of data protection compliance (E16: 52). These providers are more open to experimenting with new technologies as it enhances their marketability in future roles (E16: 52).

Expert 10 expects the adoption of public cloud services to impact the culture of the organization. The new approach involves integrating IT from the outset, challenging, and assessing business processes for their potential for automation and digitalization right from the beginning (E10: 64). This is a shift from the traditional model where business units might design processes that IT subsequently digitizes, to a model with proactive collaboration of business and IT units from the start (E10: 64).

Regarding automation, the goal is indeed to automate as many processes as possible as part of the cloud transformation, but within the bounds of regulatory guidelines (E10: 98). Importantly, they emphasize the concept of human-friendly automation to gain acceptance from employees (E10: 98; E16: 46). The organization has initiated an alliance on this subject, aiming to ease the workload of staff members without fully replacing them (E10: 98).

To summarize, the public administration's journey towards public cloud adoption is driven by the need to mitigate workforce reductions due to impending retirements and competition for talent with the private sector. The changeover is historically characterized by concerns of many stakeholders towards external cloud services, which necessitates a reassessment and changed mindset. As the administration is currently evaluating cloud services, it remains to be seen whether and how they utilize the potential the cloud offers.

6.4.4 Summary of the Remaining Interviews

While the remaining interviews discussed in this section are not included in the multiple case study due to limited data, they still provide insights that enrich the understanding of the impact of cloud adoption in different organizational contexts. Table 24 provides an overview of these findings. With special settings such as a software vendor transitioning into a cloud provider and a public administration operating in an environment sensitive to data protection, these cases present worthwhile opportunities for future research.

Remaining Interviews		
Company	Challenges	Best Practices
Aerospace Company	<ul style="list-style-type: none"> Diverse Workforce: Long-Term Employees, Graduates, Manufacturing Workers, and PhDs Rapid Changes of Cloud Software, Especially SaaS, Is Challenging to Especially Long-Term Employees Finding a Middle Ground to Meet Different Needs and Expectations of Modern Work Environments 	<ul style="list-style-type: none"> Offering a Diverse Set of Training Programs
IT Services & Software Company	<ul style="list-style-type: none"> Impact of Transitioning Into a Cloud Company on the Business Model is Often Underrated Operational Changes, e.g., for Developers and Sales Employees 	<ul style="list-style-type: none"> Sensitizing Management to the Cloud and Creating Awareness of Business Impact Internal Marketing and Communication to Manage the Transformation
Public Administration	<ul style="list-style-type: none"> Concerns Regarding Public Cloud Services Due to Regulation Parts of the Workforce Are Cautious With New Technologies 	<ul style="list-style-type: none"> Persistent Communication to Sensitize Stakeholders to the Cloud Thinking IT Together With Business Processes From the Beginning

Table 24: Challenges and Best Practices Identified in the Remaining Interviews

Source: Own Representation

6.5 Cross Case Analysis

6.5.1 Recap of Initial Settings and Identified Success Factors

The initial settings of the three organizations differ in some respects, while in others they share commonalities. In contrast to MediaCorp and SoftwareCorp, InsuCorp is operating in industry sector that is subject to stringent regulation. SoftwareCorp stands out with its core competency in IT and software development, whereas MediaCorp and InsuCorp focus on entertainment content production and providing finance and insurance services, respectively. Both MediaCorp and InsuCorp are undergoing cloud transformations (Archival Source 6, 2021; Archival Source 1, 2024). At SoftwareCorp, there is no clear directive from the management regarding cloud adoption, however, the company increasingly utilizes cloud-based solutions over on-premise options, both for its offerings on the market and internal usage (E7: 23; E8: 23, 25; E20: 23). The ServiceNow migration can be seen as a large migration project that has been going on since 2019 (E20: 17). Both MediaCorp and InsuCorp pursue a cloud-first strategy, with a preference for SaaS (E5: 19, 27; E11: 16). The scope of the cloud adoption efforts of all three organizations is not restricted to certain divisions but affects the entire enterprises (E11: 24; E17: 25). Table 25 summarizes the initial settings of the three cases.

The within case analyses show that there are both similarities and differences among the identified success factors, challenges, and best practices at MediaCorp, InsuCorp and SoftwareCorp. To provide an overview, Table 26 depicts shared and exclusive success factors identified across the three companies. Note that for this table, I combined similar success factors in the following way. I merged *Skills and Knowledge of ServiceNow Among the Workforce* (identified at SoftwareCorp) into *Cloud Skills Among the Workforce* (identified at

MediaCorp and InsuCorp). Further, I merged *Establishment of a ServiceNow Center of Excellence* (identified at SoftwareCorp) into *Establishment of Organizational Cloud Units* (identified at SoftwareCorp). Finally, I combined *Harmonization of IT System Landscape* and *Process Harmonization* (identified at SoftwareCorp) into *Harmonization*. Combined success factors are marked with an asterisk in Table 26. Additionally, I renamed the ServiceNow-specific success factors at SoftwareCorp to abstract from this specific cloud platform to a more general narrative. Thus, I renamed *Relationship and Communication With ServiceNow* to *Relationship and Communication With Cloud Provider*, and *Attitude Towards ServiceNow as an External Solution* to *Attitude Towards Cloud Provider*. I marked these two abstracted success factors with a double asterisk.

Aspect	MediaCorp	InsuCorp	SoftwareCorp
Industry Sector	Media and Entertainment	Insurance and Finance	IT and Software
Industry Sector Stringently Regulated?	No	Yes	No
Core Business Focused on IT?	No	No	Yes
Type of Cloud Examined Cloud Adoption	Cloud Transformation	Cloud Transformation	Large Cloud Migration Project (ServiceNow Adoption)
Cloud Strategy	Cloud-First with Preference for SaaS	Cloud-First with Preference for SaaS	Tendency Towards Cloud Services, But No Clear Directive
Scope of Transformation/Migration	Enterprise-Wide	Enterprise-Wide	Enterprise-Wide

Table 25: Initial Settings at the Three Cases

Source: Own Representation

Success Factor	MediaCorp	InsuCorp	SoftwareCorp
Cloud Skills Among the Workforce*	x	x	x
Establishment of Organizational Cloud Units*	x		x
Harmonization*		x	x
Cloud Governance and Coordination	x		
Value Communication and Exploration	x		
Awareness of Changed Financial Paradigm	x		
Migration of Systems With Industry-Specific Requirements		x	
Business Case Orientation		x	
Approach Towards Cloud Migration Projects		x	
Relationship and Communication With Cloud Provider**			x
Attitude Towards Cloud Provider**			x

Table 26: Socio-Technical Success Factors per Organization

Source: Own Representative

Table 26 shows that the only success factors common across all three organizations is *Cloud Skills among the Workforce*. MediaCorp and InsuCorp share *Establishment of Organizational Cloud Units* as a success factor, while InsuCorp and SoftwareCorp share *Harmonization*. The remaining success factors are exclusive to the respective companies. Note that due to the limited scope of this thesis, this list is not exhaustive. In the following, I describe similarities and

differences across the cases in more detail, while not restricting the analysis to the above success factors.

6.5.2 Similarities Across the Cases

A common success factor across all three organizations are the cloud skills among the workforce, or in the case of SoftwareCorp, the skills and knowledge of ServiceNow. All the examined companies invest heavily in training and further education to upskill their workforce for the new demands that cloud integration entails. MediaCorp, InsuCorp, and SoftwareCorp offer a wide range of training options and methods, such as in-house training, certifications from cloud providers, and external platforms like LinkedIn Learning and Udemy. MediaCorp also emphasizes the combination of theoretical knowledge and practical experience by providing playgrounds, i.e., safe cloud environments where employees can try out different cloud services without the risk of incurring additional costs (E11: 36; E12: 46). This emphasis on training and further education reflects the company's recognition of the critical role that skilled workers play in successfully adopting cloud solutions.

Despite these training options, MediaCorp, InsuCorp, and SoftwareCorp each face significant challenges in recruiting skilled experts of the cloud platforms the organizations integrate, which represents a hurdle that complicates their cloud adoption efforts. While the integration of cloud services can eliminate certain in-house tasks like physically managing on-premise data centers, it increases the demand for more complex jobs that require experience and end-to-end understand of the system landscape (E5: 65). It remains to be seen whether the companies will be able to compensate for this shortage of skilled workers in the long run with measures such as the training possibilities mentioned above.

All three companies established specialized organizational units associated with the cloud adoptions. InsuCorp established a Cloud CoE (E5: 55); however, I did not discuss this entity further, as none of the interviewed experts were part of it. SoftwareCorp established a ServiceNow CoE to govern the migration (E20: 55), while MediaCorp established the Cloud Competence Center as an overarching cloud unit as well as the Cloud Core Team, which has a stronger focus on operation and implementation (E11: 42). Further, MediaCorp is soon to establish the Cloud Enablement Team to enable other units for current and future migration projects (E11: 42, 46; E19: 44). These results show that the organizations have recognized the need to adjust their organizational structures to succeed in their cloud journeys.

Harmonization was a success factor for both InsuCorp and SoftwareCorp. While InsuCorp focuses on the harmonization of its infrastructure and application landscape (E5: 41; E13: 37, 96; Archival Source 8, 2021), SoftwareCorp emphasizes the need for process harmonization and views the ServiceNow migration as a chance to rethink existing processes and discard outdated practices (E7: 29, 81). The company employs both internal and external process consultants for this purpose (E7: 33; E18: 49). The analysis also showed that shifting from on premise to the cloud does not necessarily lead to a more harmonized landscape at the application level, as cloud providers typically offer a wide range of technologies (E13: 96-98). For example, AWS does not provide just a single database system on its platform; instead, it offers a variety of options, including traditional SQL systems and document-oriented database

systems (E13: 96-98). In summary, these findings highlight that while cloud adoption presents an opportunity to harmonize processes and systems, it also necessitates careful consideration.

Both InsuCorp and SoftwareCorp face the challenge of tailoring the cloud systems to their specific need. Among the three presented cases, MediaCorp exemplifies a typical example of a company undergoing cloud transformation, with its core competencies rooted in the media and entertainment sector, rather than IT, and operating within an industry that is not subject to stringent regulations. In contrast, the special settings of InsuCorp and SoftwareCorp require both companies to make adjustments to their respective cloud systems, although for different reasons and with varying degrees of influence over the cloud providers. InsuCorp's modifications are driven by compliance requirements inherent to the finance and insurance sector (E13: 18), while SoftwareCorp, as a frontrunner and one of the largest customers of ServiceNow, often pushes the cloud platform to its operational limits (E20: 61). This position allows SoftwareCorp to not only address its specific needs but also influence ServiceNow's development, leading to the incorporation of their feedback into subsequent releases of the platform (E7: 27). Unlike SoftwareCorp, InsuCorp lacks similar influence (E17: 81), resulting in a dynamic where their adjustments are more about conforming to external standards rather than shaping the cloud service's evolution. This distinction underscores the influence a company's industry sector and relationship with a provider can have on their cloud adoption.

The interviews also captured some aspects that I have not explicitly discussed in the case analyses, as I did not identify them as challenges, best practices, or success factors for the respective companies. Still, they are worth to be mentioned in the following.

One of these topics is whether the organizations rely on science in their cloud initiatives. Among the twenty experts interviewed, only Expert 2, working at an IT service provider, reported that his company consulted academic literature during their cloud transformation (E2: 25). As the firm is positioning itself as a cloud vendor, they applied a model provided by Böhm et al. (2010) to delineate value streams across their various cloud business models (E2: 27). The fact that only one organization sought academic guidance underscores the primary motivation for this thesis, i.e., the scarcity of scientific resources addressing the socio-technical factors of cloud adoption.

Further, all the companies indicated that they do not use specialized tools for tracking cloud migration projects. Instead, they on their standard key performance indicators and project management tools like Jira. (E5: 89; E7: 77; E8: 58; E9: 99). This indicates that from a project management perspective, cloud migration does not significantly differ from traditional IT projects.

The interviews also revealed that no company has implemented a cloud-specific feedback mechanism to gather workforce insights. Instead, feedback on cloud adoption is either not collected at all (E4: 81; E11: 40; E17: 73), or the same methods as for on-premise systems, such as usability tests, are employed to gather insights about how the workforce is getting along with the cloud system (E7: 77).

6.5.3 Differences Across the Cases

SoftwareCorp faces a unique cultural challenge that sets it apart from InsuCorp and MediaCorp: the “not invented here” syndrome, as Expert 18 (35) called the phenomenon of many SoftwareCorp employees favoring developing in-house software over buying external solutions. While goals of the cloud transformations at InsuCorp and MediaCorp are a less complex system landscape and reduction of workload (E9: 37; E13: 37), large parts of the workforce at SoftwareCorp show no sympathy for such strategies. Expert 20 (35) attributes this prevailing culture to the average SoftwareCorp employee viewing himself as a software developer. This represents a notable contrast to InsuCorp and MediaCorp, whose core businesses are not centered around IT or software. It is important to note that the resistance among SoftwareCorp’s staff is not specifically directed at cloud solutions per se, but rather at adopting external solutions in general, with ServiceNow’s cloud platform being one such example. As outlined in the within case analysis, SoftwareCorp heavily invests in change management and communication to deal with this issue.

Like SoftwareCorp, MediaCorp also faces resistance to cloud adoption. However, this resistance cannot be attributed to general skepticism about cloud computing or external solutions, but rather to a perceived lack of added value from migration projects (E12: 38). The company mitigates this problem by communicating and demonstrating the added value of the cloud and letting the employees practically explore the cloud’s benefits (E11: 34; E12: 38, 40).

SoftwareCorp finds itself in another unique situation regarding the relationship with its cloud platform provider ServiceNow for two reasons. First, SoftwareCorp is one of ServiceNow’s largest customers, thus often pushing the system to its boundaries and encountering scenarios that have not been anticipated by ServiceNow’s developers (E20: 61). Second, the company possesses significant expertise in IT and software development, as these fields represent its core business. While the first reason often requires SoftwareCorp to develop custom modifications on the ServiceNow’s cloud platform to meet their needs as a large customer, their technical capabilities enable them to do so. ServiceNow often incorporates SoftwareCorp’s custom development in subsequent releases (E7: 27). The relationship between the two companies is also characterized by the fact that they are mutual customers of each other (E7: 19; E18: 35). Compared to MediaCorp and InsuCorp, this situation is exclusive to SoftwareCorp. The relationship between SoftwareCorp and ServiceNow demonstrates that possessing IT and software capabilities can reduce dependence on a cloud provider.

In comparison to MediaCorp and SoftwareCorp, InsuCorp faces a unique challenge due to the industry sector the company operates in. The longevity of insurance products, often spanning decades (E13: 41), is challenging from a technical and financial perspective. On the one hand, the underlying legacy IT systems of such products are technically complex to migrate, for example because the involved programming languages do not work in cloud environments (E13: 22). On the other hand, migrating these systems to modern frameworks to work in the cloud would significantly increase operational costs (E13: 35). This problem originates from the fact that back in the day, IT systems were designed to be extremely efficient in comparison to today’s frameworks because resources like memory were scarce (E13: 35). Adding up to this, migrating such systems does not yield any additional revenue, because it merely keeps

already running systems alive (E13: 20). This issue demonstrates that organizations should not enforce cloud adoption for every use case. Instead, they should consider the unique requirements and challenges of their industry sector to make informed decisions.

The impact of cloud adoption on IT roles at InsuCorp and MediaCorp is divergent. At InsuCorp, the cloud transformation involves phasing out in-house data centers in favor of external cloud solutions, which has led to the elimination of roles focused on the physical management of servers and racks, for instance (E5: 79). Expert 5 mentioned that these roles are not completely vanishing from the labor market, as the affected individuals often switch to work in the data centers of cloud providers like Microsoft (E5: 79). In contrast, MediaCorp adopts a complementary approach where, due to the heavy reliance on the on-premise infrastructure native to the media sector, cloud services are integrated alongside the existing data centers (E9: 109). For MediaCorp, this adoption approach means that IT infrastructure roles are preserved. Instead, the most significant impact of the cloud transformation is in roles like software developers and data engineers, who can now leverage the capabilities of modern cloud technologies (E9: 65; E12: 44). This contrasting scenario between the two companies underscores the divergent implications of cloud adoption based on the pursued IT infrastructure setup.

Regarding the influence of cloud adoption on core business processes and end users, the three companies express different views. Expert 13 (47) from InsuCorp stated that employees concerned with core business functions, such as insurance clerks, are primarily interested in the user interface and indifferent to whether the underlying system is cloud-based. However, the expert acknowledged that end users typically resist changes that require them to adjust their click paths and workflows. Expert 17 (53), also from InsuCorp, noted that cloud adoption impacts specific tasks in core business processes, for example by pre-authenticating calls and loading relevant customer files. This allows staff to directly address customer issues without preliminary exchanges. At MediaCorp, the integration of cloud services simplifies and speeds up on-site content production processes (E9: 67). For instance, a cameraman can instantly upload footage to the cloud, allowing editors to begin their work immediately (E9: 67). This is a significant improvement over older methods, such as physically transporting VHS tapes to a location for editing, thereby reducing time pressure, increasing flexibility and speed in content production (E9: 67). Additionally, Expert 11 (28) notes that the company is shifting towards using standardized cloud solutions instead of custom developments. This requires adapting current workflows to meet these new standards, which represents a significant change for employees who have long used software specifically tailored to the media sector (E11: 28). At SoftwareCorp, the most significant change for end users, typically support agents (E20: 25), is the new ServiceNow user interface compared to the previous in-house system (E18: 43). This new UI requires users to adapt to different navigation layouts and learn where to find specific information across various tabs (E18: 43). Further, end users benefit from improved performance (E18: 45). However, SoftwareCorp recognizes that frequent updates, which are typical for cloud services, require end users to continuously adapt (E18: 61). While this scenario can be challenging, Expert 18 emphasized that the era of static software is over and states that proper communication during rollouts and releases are essential to help end users adjust (E18: 61).

6.5.4 Conclusion

Table 27 summarizes the similarities and differences among the cases identified in the cross-case analysis. It also includes the aspects that relate to the initial settings of the organizations as described in Section 6.5.1 and depicted in Table 25 to provide a comprehensive overview of the cases.

Aspect	MediaCorp	InsuCorp	SoftwareCorp
Industry Sector	Media and Entertainment	Insurance and Finance	IT and Software
Industry Sector Stringently Regulated?	No	Yes	No
Core Business Focused on IT?	No	No	Yes
Type of Cloud Examined Cloud Adoption	Cloud Transformation	Cloud Transformation	Large Cloud Migration Project (ServiceNow Adoption)
Cloud Strategy	Cloud-First With Preference for SaaS	Cloud-First With Preference for SaaS	Tendency Towards Cloud Services, But No Clear Directive
Scope of Transformation/Migration	Enterprise-Wide	Enterprise-Wide	Enterprise-Wide
Offering Extensive Training and Further Education?	Yes	Yes	Yes
Facing Shortage of Skilled Cloud System Experts?	Yes	Yes	Yes
Organizational Cloud Units	Cloud Competence Center, Cloud Core Team, Cloud Enablement Team	Cloud Center of Excellence	ServiceNow Center of Excellence
Harmonization	Not Discussed in Detail	Focus on Harmonization of System Landscape	Focus on Harmonization of Processes
Adjustment of Cloud Services Necessary?	No	Yes	Yes
Relying on Academia to Guide Cloud Adoption?	No	No	No
Sticking to Known Project Management Tools for Cloud Migrations?	Yes	Yes	Yes
Offering Cloud-Specific Feedback Mechanism?	No	No	No
General Resistance Towards External Solutions ("Not Invented Here"-Syndrome)?	No	No	Yes
Developing Extensions to Cloud Platform Which Are Later Incorporated by Provider?	No	No	Yes
Need to Consider Longevity of Products?	No	Yes	No
Most Affected Roles	Software- and Data-Related Roles	(Physical) IT Infrastructure Roles	Not Applicable
Impact on Core Business and End Users	Significant for Some Core Business Processes	Moderate	Moderate

Table 27: Overview of Similarities and Differences Among MediaCorp, InsuCorp and SoftwareCorp

Source: Own Representation

The analysis shows that there are several factors that influence the cloud adoption at the three organizations. InsuCorp needs to adjust cloud services, as vendors do not provide regulatory compliance out of the box. Further, the longevity of insurance products poses challenges in migrating legacy systems to the cloud. SoftwareCorp's cloud adoption is influenced by its

technical expertise and its position as one of ServiceNow's largest customers, often pushing the platform to its boundaries. While being frontrunner requires SoftwareCorp to develop custom extensions to the ServiceNow platform when encountering problems, their technical capabilities enable them to do so. On the flipside, the software expertise among the workforce leads to a culture of resistance against external solutions, as large parts of the workforce favor in-house development. In contrast, MediaCorp can be seen as a traditional example of a company approaching a cloud transformation, as the company is not operating in a strictly regulated environment, nor lie its core capabilities in IT or software. The analysis also shows that the cloud's impact on IT roles is influenced by the extent of cloud infrastructure integration. At InsuCorp, much of the on-premise data center landscape has been migrated to the cloud, significantly impacting IT infrastructure roles. In contrast, MediaCorp integrates cloud services alongside its existing on-premise infrastructure. Thus, IT infrastructure roles are less affected by cloud adoption; instead, roles related to software and data, such as software developers and data engineers, experience significant changes, as they can leverage the benefits of cloud technology in their daily work. Besides these differences, the companies share common best practices, such as upskilling their workforces, establishing organizational cloud units, and the harmonization of systems and processes. Overall, the analysis shows that organizations integrating cloud services can apply best practices that are not exclusive to their sector but must also address context-specific challenges and find ways to overcome them.

7 Framework and Discussion

7.1 A Socio-Technical Framework for Cloud Transformation

This section investigates RQ 3: *What are recommendations for organizations to facilitate the socio-technical shifts necessary for cloud transformation?* by synthesizing the insights obtained in the literature review and the multiple case study. The goal is to guide practitioners in their cloud transformation journey. Thus, I present a holistic, yet concise socio-technical framework of recommendations that can be employed by organizations to assist their journey to the cloud. The five dimensions of the framework (*People, Strategy, Organization, Processes, and Technology*) are based on the selective codes identified in grounded theory coding process of the case study. Figure 6 depicts the framework. In the following, I describe it in more detail along its five dimensions.

PEOPLE DIMENSION

R1: Communicate and demonstrate the cloud's added value – Clearly communicate and demonstrate the added value of the cloud transformation in the organization. This is crucial in both the individual and the organizational context. Communicate how the cloud changes or simplifies the way of working of individual employees. If certain individuals are not directly affected in their work routines, explain the organizational context of the cloud's benefits to foster support for the transformation. Do not view value communication and demonstration as a one-time event, but rather as an ongoing effort to reinforce advantages and address emerging concerns throughout the transformation.

R2: Let workforce experience added value hands-on – Not only communicate the added value of cloud services, but also give the workforce the opportunity to experience the advantages firsthand. Allowing staff to interact with the new technology in their daily tasks enables them to directly observe the enhancements in efficiency and functionality. This practical exposure helps fostering their understanding and acceptance of the cloud transformation.

R3: Offer a wide range of training possibilities to upskill the workforce – Given the fact that many organizations face challenges in acquiring IT talents on the job market, offering a wide array of training opportunities is essential to upskill the existing workforce. Organizations should consider providing both internal and external resources, as well as on-site and online courses, to ensure employees can acquire the necessary skills. Further, do not only rely on theoretical training but also provide practical exploration, for instance through playground accounts on cloud platforms, where employees can try out different services in a safe environment.

R4: Foster communication among cloud practitioners within the organization – Fostering communication among cloud practitioners within the company is essential for maximizing efficiency and leveraging synergies. By ensuring that team members are aware of each other's projects and solutions, the organization can avoid redundant efforts and promote the reuse of existing solutions. This can be achieved via regular meetings and workshops, for example.

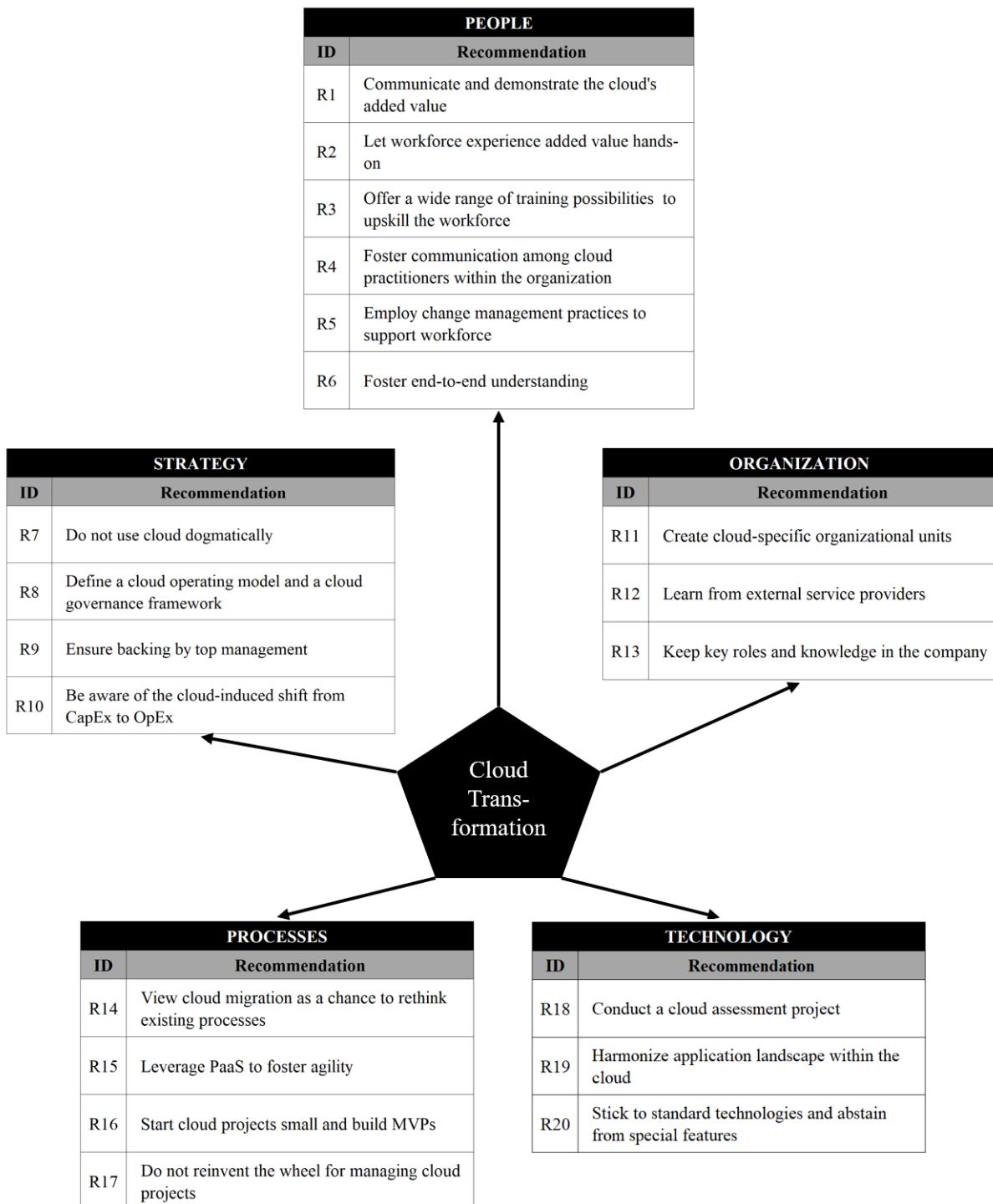


Figure 6: 5-Dimensional Socio-Technical Framework for Cloud Transformation
Source: Own Representation

R5: Employ change management practices to support workforce – Accompany the workforce in the cloud transformation by employing change management practices. Give employees time to adapt and address their fears. In the specific context of IT and software companies, if individual employees remain resistant to the cloud, consider allowing them to switch positions within the organization or to manage legacy systems that run in parallel

R6: Foster end-to-end understanding – While the integration of cloud services can reduce the need for simplistic roles, especially in the physical management of IT infrastructure, it also increases the need for professionals with an end-to-end understanding of the system landscape. As many organizations struggle to find talents with such capabilities on the job market, they should foster the end-to-end understanding of their existing workforce promoting cross-training between IT and business units. This approach assists in assessing the overall implications of decisions in the cloud context.

STRATEGY DIMENSION

R7: Do not use cloud dogmatically – Adopting a cloud-first approach should not be dogmatic but rather strategically aligned with business objectives. Each use case must be rigorously assessed to determine if cloud services offer the most efficient solutions. Be aware that for certain use cases, such as high-performance storage, the cloud is multiple times more expensive than on-premise options. This approach ensures that the cloud transformation is driven by business goals rather than merely by prevailing technological trends.

R8: Define a cloud operating model and a cloud governance framework – When starting a cloud transformation, it is vital to first define how value is to be created through cloud adoption. Thus, define a cloud operating model that describes what to do in the cloud, i.e., the actions to take to create value. This model serves as a “business model” for the cloud usage in the organization. Next, create a cloud governance framework that defines how to execute these actions. The goal of this framework is to ensure a structured operational approach towards the cloud transformation. It involves aspects such as defining the technology stack to use, specifying account creation on cloud platforms, developing security recommendations, defining how to use logging and monitoring in the cloud. It also covers identity and access management, as well as role management.

R9: Ensure backing by top management – Securing a mandate or strong backing from top management is essential for successful cloud transformation. When executives do not embrace transformation initiatives, resistance and skepticism may arise among the workforce. Demonstrating commitment at the highest levels ensures that the entire organization aligns with the transformation.

R10: Be aware of the cloud-induced shift from CapEx to OpEx – The integration of cloud services often results in the reduction of CapEx and increase of OpEx, which can negatively impact traditional financial metrics such as EBITDA. It is crucial for IT leaders to communicate this shift to financial stakeholders to foster an understanding of the new cost structure associated with cloud usage. By clearly explaining the long-term financial implications, organizations can ensure that decision-makers are well-informed and supportive of the strategic shift towards utilizing more cloud services.

ORGANIZATION DIMENSION

R11: Create cloud-specific organizational units – Establish a cloud unit within the company that takes care of adhering to the cloud governance framework. This will typically be called the cloud center of excellence or cloud competence center. This unit should focus on

governance, setting technical standards and policies to guide all cloud initiatives in the organization. Additionally, depending on the size of the organization and scope of the transformation, establish one or more operational cloud units, that assist in migration projects. Finally, consider forming a cloud enablement team that enables other units and equips them with necessary skills for current and future cloud migrations.

R12: Learn from external service providers – Leveraging the expertise of external service providers is critical during cloud migration projects, as these specialists bring valuable knowledge and experience that can accelerate the process. Ensure that these providers are not just executing tasks, but also transferring knowledge to the internal team. This collaborative approach enhances the skills of the in-house staff, thus ensuring that the organization is better prepared to manage the cloud services post-migration.

R13: Keep key roles and knowledge in the company – When your organization decides to engage external partners for cloud migration projects, still make sure to preserve key roles and knowledge in the company. Especially for large migration projects that have a long-term impact on the organization, it is important to keep a certain level of knowledge in the company to manage and maintain the system post-migration.

PROCESSES DIMENSION

R14: View cloud migration as a chance to rethink existing processes – Viewing cloud migration as an opportunity to reevaluate and improve existing processes can assist organizations in achieving higher operational efficiency. While many organizations view cloud transformation as a chance to harmonize their system landscape, consider also the harmonization of processes. By challenging outdated habits and workflows, organizations can streamline their operations. Also consider employing a combination of internal and external process consultants to gain the necessary insights to identify areas for improvement and implement improved practices.

R15: Leverage PaaS to foster agility – Cloud platform allow developers to quickly set up environments and deploy solutions. Overall, PaaS can be a driver for agility within the organization, eliminating the need for tedious procurement processes of in-house infrastructure. Leverage these capabilities by allowing development teams to self-organize and work agile.

R16: Start cloud projects small and build MVPs – Approach cloud migration projects with a limited scope and build MVPs early. Leverage the cloud's offering to start projects by deploying limited resources. This way, potential road blockers that hinder the overall success of a project can be identified early. Overall, approach cloud migration projects rather in a bottom-up manner instead of starting them top-down at a strategic level.

R17: Do not reinvent the wheel for managing cloud projects – When managing cloud migration projects, there is no need to approach them significantly different than other IT projects. When tracking and evaluating cloud projects, stick to proven key performance indicators and project management tools such as Jira.

TECHNOLOGY DIMENSION

R18: Conduct a cloud assessment project – Conduct a cloud assessment project to evaluate the current on-premise system landscape to assess what systems are suitable for migrating to the cloud. Consider both the technical assessment as well as the financial assessment. If a given system communicates with many other on-premise systems, it might not be suitable for migrating to the cloud. Include not only architects in this project, but also the product owners of the respective applications to gain a holistic view of the migration's potential implications.

R19: Harmonize application landscape within the cloud – Shifting systems to the cloud does not automatically mean harmonization. If your goal as an organization is to harmonize and simplify the existing system landscape, focus on certain technologies within the cloud offering. Large cloud providers offer a wide range for each category of systems. To illustrate, AWS does not offer just one single database system, but many with different underlying technologies, such as SQL and document-oriented databases. Therefore, focus on technologies to avoid a complex application landscape within cloud environments.

R20: Stick to standard technologies and abstain from special features – Sticking to standards and abstaining from features support the simplification of your cloud application landscape. When the motivation for cloud transformation is to simplify applications and reduce dependency on highly specialized legacy system experts, stick to standard technologies like SQL instead of special dialects to ensure future compatibility, even if it means abstaining from features. Avoid changing your application stack over and over, especially in business environments that are characterized by long-lively products and services, like the finance and insurance industry.

This socio-technical framework aids practitioners in their cloud transformation. Organizations that employ these recommendations can overcome challenges they face in their journey to the cloud, ultimately assisting them to achieve a successful digital transformation.

7.2 Theoretical Implications

This thesis was driven by the desire to explore socio-technical factors that are associated with cloud adoption in organizations. My goal was not only to synthesize known cloud-induced effects from existing research, but also to reveal success factors, challenges, and best practices faced by practitioners in real-world scenarios. In the following, I discuss the theoretical implications of my findings and provide a research agenda.

The first contribution of this thesis is to consolidate the socio-technical effects of cloud adoption known in academia today into a comprehensive overview. Given that the topic spans across computer science, management science, and information systems, my literature review provides a summary of the socio-technical challenges and best practices associated with cloud adoption. This allows scholars to both pinpoint topics that require additional research and identify areas that have not yet been explored.

My literature review has also unveiled that the organizational impact of cloud transformation is underrepresented in academia. While numerous articles and reviews discuss cloud migra-

tion (e.g., Jamshidi et al. (2013), Zhao and Zhuo (2014), and Gholami et al. (2016)), I am not aware of a single publication specifically dedicated to the organizational impact of cloud transformation. This topic is particularly overlooked by researchers in management science, where the focus, if cloud computing is considered at all, typically centers on pricing or optimization issues (e.g., Hartline and Lucier (2015)., Fazli et al. (2018), and Chen et al. (2019)). It is surprising that despite cloud computing's longstanding presence and ever-increasing market size (Statista, 2024b), management scholars have paid so little attention to the technology. Although researchers in the IS community have devoted more attention to socio-technical factors of cloud computing, they focus on isolated aspects (e.g., Choudhary & Vithayathil (2013), Krancher et al. (2018), Khalil & Winkler (2023)), failing to describe the bigger picture of cloud transformation. Therefore, my thesis serves as a starting point for further research on cloud transformation.

My third contribution to the academic discourse is the exploration of socio-technical challenges and best practices that organizations encounter in real-world settings. The multiple case study has shown that industry-specific requirements and the technical expertise of organizations influence cloud transformation. Among other findings, I discovered that the development of cloud skills among the workforce, the establishment of dedicated organizational cloud units, and effective communication of the cloud's added value are crucial for organizations to succeed in the transformation. Thus, my thesis represents a first step to close the gap between the current state of IS research and the practical relevance of cloud services. Based on my findings, I present a research agenda consisting of six future research questions (FRQs) to outline directions for further investigation.

As organizations integrate cloud services, not only IT operations but also core business processes can be subject to change. While the interviews for this thesis focused on IT professionals with cloud experience, the impact on main business activities, for example in the insurance or media sector, was only briefly touched upon. However, it became evident that the interviewees hold varying opinions on how cloud technology influences such essential business operations. For instance, Expert 9 from MediaCorp highlighted the benefits of cloud computing in streamlining and accelerating on-site TV production processes. The immediate uploading of footage to the cloud facilitates quicker editing and broadcasting, demonstrating a clear enhancement in productivity (E9: 67). In contrast, Expert 13 from InsuCorp suggested that cloud adoption has minimal impact on the day-to-day operations of insurance claims handlers, who show little concern for the underlying technology as long as their workflow remains uninterrupted, and the system remains ergonomic and responsive (E13: 47). These contrasting views underscore the variability in the effects of cloud adoption across different industries and suggest that further research is necessary. A deeper investigation into how cloud technologies influence core business processes in various sectors could shed light on these disparities, helping to tailor cloud adoption strategies more effectively to meet industry-specific needs. To this end, I pose **FRQ 1: What are the effects of cloud adoption on core business processes in different industry sectors?**

Introducing cloud computing in an organization affects not only IT divisions but also administrative business areas such as Procurement, Controlling, and Human Resources. In Procurement, for instance, the shift from acquiring and maintaining physical servers to managing

cloud-based services eliminates traditional hardware procurement processes, challenging the department to adapt to purchasing strategies based around subscription models and service agreements (E4: 65). Similarly, in Controlling, financial managers accustomed to CapEx on IT infrastructure must pivot to OpEx models, rethinking budgeting and financial forecasting as resources are scaled dynamically with cloud services (E4: 65). Human Resources faces the challenge of sourcing talent for new, specialized roles such as cloud architects and developers skilled in infrastructure as code, while also managing existing staff whose traditional roles are being transformed or phased out due to cloud adoption (E4: 65). While this thesis has touched on these implications, a deeper exploration of the associated challenges is necessary. For instance, interviewing employees and managers in administrative business units could provide more detailed insights. To this end, I pose **FRQ 2: How does the integration of cloud services affect administrative business units and processes?**

Cloud transformation not only impacts IT professionals but also non-IT end users within an organization. The dynamic nature of cloud services, with frequent updates and changes, demands that employees are more flexible and quicker to adapt (E1: 51). The technology necessitates a shift from past practices where software remained static until the next major update (E1: 51). Expert 1 (51) reports that this poses a major challenge in his organization, especially due to the diverse workforce, ranging from young graduates to employees who are in the company for several decades. The integration of modern SaaS solutions like Microsoft Teams exemplifies this challenge, as it must cater to both long-standing employees, who may be less motivated to embrace new technologies, and younger employees for whom using such technologies is second nature (E1: 51). Even though this thesis touched upon the impact of cloud adoption for non-IT end users, further research specifically dedicated to this topic is required. Since the interviewees chosen for the multiple case study were primarily cloud experts, interviewing end users would provide firsthand insights into their behaviors, routines, and the challenges they encounter when they use SaaS solutions instead of on-premise software. Understanding these changes can help organizations better support their staff through training and change management practices. To this end, I pose **FRQ 3: How does cloud adoption, particularly SaaS, change working routines of non-IT end users within an organization?**

Following up on FRQ 3, cloud adoption in general and specifically SaaS solutions may impact worker productivity. Cloud services are subject to frequent updates and short release cycles, which, while intended to enhance functionality, may pose challenges for worker productivity. Employees often face the necessity to adapt continuously to changes such as new user interfaces or altered workflows, which can disrupt their familiar routines (E1: 51). While SaaS allows for seamless access to applications from any device and facilitates collaboration across locations, these benefits come with the need for ongoing learning and adaptation. Exploring how factors like digital literacy or the type of work influence productivity may allow organizations to better setup their workforce through the transformation and optimize SaaS configurations to minimize disruptions. To this end, I pose **FRQ 4: How does the usage of cloud services and specifically SaaS affect the productivity of (non-IT) workers?**

As IT service providers shift towards offering SaaS versions of their products to customers, they encounter a range of strategic and operational implications different from companies that

use cloud services instead of providing them. Such a transformation into a cloud company entails more complex delivery value chains compared to traditional offerings, where software is developed and sent to the customer (E2: 19). Further, developers working at the IT provider need to new skills and technologies (E2: 19). Additionally, selling cloud solutions can be challenging for sales employees who are accustomed to offering on-premise software and have limited knowledge of cloud technology (E2: 19). To summarize, IT companies that are embarking on offering cloud solutions need to understand that cloud is not just another technology but has a major business impact (E2: 29). This topic was discussed in the interview with Expert 2; however, no further coworkers were available for interviews. Thus, the respective IT service provider is not represented as a case in Chapter 4. IS research has examined the effects of cloud computing from the perspective of software vendors (e.g., Kaltenecker et al. (2015), Xiao et al. (2020), and Schneckenberg et al. (2021)), however, these studies focus on the impact on the business model rather than socio-technical implications like the required change in mindset of developers and managers. Exploring such factors further can shed light on how IT service providers can successfully transition to SaaS offerings, refining their strategies to meet evolving market demands and customer expectations. To this end, I pose **FRQ 5: What are socio-technical implications of cloud transformation for IT service providers, especially when they shift to offering SaaS versions for their customers?**

Similar to IT service providers, public administrations face unique challenges and constraints when adopting cloud technologies. The need to develop and operate a vast amount of custom software makes cloud migration appealing not only as a technical solution but also as a strategic response to staffing constraints and the demographic shifts affecting personnel availability (E16: 26). The necessity to maintain operational continuity with aging workforce structures and under competitive salary constraints further drives the need for cloud adoption (E16: 27-28). Best practices and success factors in this setting can significantly differ from those in the private sector, making it crucial to explore these differences and develop tailored strategies for cloud adoption. For this thesis, I conducted two interviews with cloud experts from a German public administration. However, these interviews did not form a case of my multiple case study because the organization is still in the planning stages of its cloud transformation and has not yet started the implementation. Thus, further research is necessary to investigate the unique challenges and requirements that public entities face when shifting to the cloud. To this end, I pose **FRQ 6: What are challenges and best practices of cloud transformation for public administrations?**

Table 28 provides an overview of the proposed future research questions.

7.3 Practical Implications

Thus far, academia has lacked to provide guidance for organizations embarking on cloud transformation. To illustrate, out of the 20 cloud experts I interviewed for the multiple case study, only one interviewee reported that his company consulted a scientific article (Böhm et al., 2010) to assist them in their cloud transformation. Instead, practitioners are aware of and guided by non-academic sources, such as the six R's identified by AWS, the cloud adoption frameworks of the hyperscalers, and a book on cloud strategy by Hohpe (2020). To this end, this thesis outlined success factors, challenges, and best practices that organizations encounter

in real-world cloud transformations, offering guidance for practitioners undergoing cloud transformation.

Organizations can leverage the insights from this thesis to create awareness of the socio-technical implications of cloud transformation. Among other factors, my work equips them with awareness for the importance of communicating the cloud's added value, establishing cloud specific organizational units, upskilling the workforce, or harmonizing systems and processes. Moreover, the thesis sensitizes practitioners to consider industry-specific requirements and challenges when embarking on cloud transformation. In addition, I provided meaningful insights for the special case of software vendors and the cultural changes they encounter when integrating external cloud solutions. To summarize, my thesis serves as a valuable resource for organizations that are either undergoing a cloud transformation or planning to do so.

Future Research Questions
FRQ 1: What are the effects of cloud adoption on core business processes in different industry sectors?
FRQ 2: How does the integration of cloud services affect administrative business units and processes?
FRQ 3: How does cloud adoption, particularly SaaS, change working routines of non-IT end users within an organization?
FRQ 4: How does the usage of cloud services and specifically SaaS affect the productivity of (non-IT) workers?
FRQ 5: What are socio-technical implications of cloud transformation for IT service providers, especially when they shift to offering SaaS versions for their customers?
FRQ 6: What are challenges and best practices of cloud transformation for public administrations?

Table 28: Future Research Questions

Source: Own Representation

8 Limitations, Future Work, and Conclusion

8.1 Limitations

Both the literature review and the multiple case study conducted for this thesis face limitations, which I describe in the following.

For the literature review, I might have overlooked important publications, as alternative outlets or keywords not included in the search strategy might have yielded additional valuable insights. However, by focusing on outlets of high quality in the domains of management science, information systems, and computer science, employing broad search terms, and applying a forward and backward search, the literature review is representative for the current state of research.

The process of including and excluding sources is to a certain extent subjective. Selecting the articles mainly on their titles, abstracts and keywords may have led to the exclusion of relevant studies. However, cloud computing is a well-established technology in practice and has been researched exhaustively for many years. Thus, there is a high volume of publications that are possibly relevant spread across several scientific fields, and searching this body of literature by reading all articles entirely is not possible in the setting of this thesis. Nevertheless, with the iterative inclusion and exclusion process described in Section 3.1, I reduced the likelihood of overlooking important publications.

Regarding the multiple case study, there also exist limitations. First, more interviews in the respective organizations may have yielded further insights. Additionally, longer interview durations would have allowed to ask more questions or further inquiries. Nevertheless, by conducting several interviews at each organization and augmenting the interviews with archival data, I was able to ensure a holistic view of the cloud situation at the respective organizations.

Semi structured expert interviews are subjective in nature. First, the quality and depth of information obtained can vary depending on the expertise and communicative ability of the interviewee. Second, expert interviews may also introduce bias, as the information provided is influenced by the personal experiences and perspectives of the interviewees. Lastly, the selection of experts may be biased towards those who are more accessible or willing to participate, which may not accurately represent the broader field of cloud migration expertise. However, the semi-structured interview approach fits the exploratory nature of this thesis. As the goal was not to find a set of right answers to certain questions, but rather to explore different views to create a thorough understanding of the cloud's impact on the organizations, this method was suitable to investigate the research questions at hand.

Despite the mentioned limitations, the selected scientific methods were suitable for gaining exploratory insights into the socio-technical factors associated with cloud adoption, drawing from both theory and practice.

8.2 Future Work

The research conducted in this thesis is explorative in nature, unveiling socio-technical implications of cloud adoption in organizations. Still, the wide range of factors identified suggest several areas for future research, some of which I have described in the research agenda. Addressing these topics, extending this study to include a larger number of companies across diverse industry sectors could provide a broader perspective on the socio-technical factors of cloud transformations, enhancing the generalizability of the findings. Moreover, this study can be extended to include interviews with non-cloud experts, in particular end users of the technology. To illustrate, employees in controlling, finance or customer service could be interviewed about how cloud adoption changes their tasks and routines or how they cope with frequent changes of SaaS products. Such an approach would allow creating guidelines for handling cloud transformation specifically designed for non-IT users. In addition, conducting a longitudinal study would yield additional insights, tracking the same organizations over several points in time to observe how cloud adoption evolves. This method would foster the understanding of long-term effects, for example on the structure of organizational units and core business operations. To summarize, this thesis provides a valuable starting point for exploring socio-technical impact of cloud adoption and can be extended for future research.

8.3 Conclusion

Thus far, socio-technical factors of cloud transformation have been poorly understood by research. While computer science has paid much attention to the purely technical aspects of cloud computing, the technology is underrepresented in management sciences. This is especially true for its socio-technical implications, such as the influence on organizational structures, processes, or corporate culture. The IS community has not neglected the organizational implications of the cloud; however, it focuses on single aspects, thus lacking to provide a comprehensive framework for cloud transformation. To illustrate, among the 20 interviews held for this thesis, only one expert stated that his company consulted a scientific article to assist them in their cloud transformation (E2: 25). This fact indicates that research fails to equip practitioners with relevant insights about cloud transformation. To narrow the gap between scholarly research and practical relevance, I conducted a structured literature review (Webster & Watson, 2002) and a multiple case study (Yin, 2014) at three organizations active in the insurance, media, and IT sectors, respectively. Drawing upon insights from scientific articles, semi-structured interviews with cloud experts, and archival data, I outlined challenges organizations face in their cloud adoption efforts and best practices they can employ to overcome these hurdles. Among other aspects, the findings revealed that organizations must aid their employees in developing the necessary skillset for working with cloud technology, establish specialized organizational cloud units to govern and execute the initiatives, and communicate the added value of the cloud clearly to handle resistance towards the technology among the workforce. The results further indicated that industry-specific requirements, such as compliance to regulation in the finance and insurance sector, increase the complexity of cloud transformation. Drawing upon the findings, I developed a set of research questions that are worth to be investigated in the future. Overall, this thesis not only sets out to spark further research on the socio-technical effects of cloud adoption, but also to aid organizations in their journey to the cloud, paving the way for a smooth digital transformation.

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Appendix

Appendix A Concept Matrix

Anhang A.1 Anhang-Gliederungsebene 2

Author and Year	Cloud Adoption Approaches			Success Factors	Challenges and Best Practices		
	Types of Migration Approaches	Procedural Approaches	Comprehensive Adoption Frameworks		Strategic and Organizational Implications	Impact on Processes and Way of Working	People-Based Factors
Alharthi et al., 2017				x			
Ali et al., 2021					x		
Ali, 2019					x		x
Allen, 2021	x						
Arpacı, 2017							x
AWS, 2021			x				
Battleson et al., 2016						x	
Bazi et al., 2017		x					
Beserra et al., 2012		x					
Cetindamar et al., 2024							x
Choudhary & Vithayathil, 2013					x		
Fahmideh et al., 2019		x					
Garrison et al., 2012				x			
Garrison et al., 2015				x			
Gholami et al., 2016	x						
Google, 2024			x				
Handley et al., 2022	x						
Hohpe, 2020	x						
Huntgeburth et al., 2013							x
Jamshidi et al., 2013	x	x					
Khajeh-Hosseini et al., 2012		x					
Khalil & Winkler, 2023						x	
Khalil et al., 2017					x		x
Khayer et al., 2020				x			
Krancher et al., 2018						x	
Malladi & Krishnan, 2012					x		
Marston et al., 2011					x		x
McAfee, 2011		x			x		x
Menzel et al., 2015		x					
Microsoft, 2024			x				
Opala-Martins et al., 2016					x		
Orban, 2016	x						
Pahl et al., 2013		x					
Raut et al., 2017				x			
Rockmann et al., 2015					x		
Sarkar & Young, 2011					x		
Venters & Whitley, 2012					x		x
Vithayathil, 2018					x	x	x
Watson, 2010	x						
Winkler & Brown, 2013					x		
Wulf et al., 2019					x	x	x
Yang et al., 2015							x
Zhao & Zhou, 2014	x						
Ziebell et al., 2019				x	x	x	
Total	8	8	3	6	15	6	11

Appendix B Interview Guideline

Phase 1: Begrüßung und beruflicher Hintergrund des Interviewpartners (ca. 5 Minuten)

Begrüßung

- 1) Für Teilnahme bedanken.
- 2) Mich selbst vorstellen, Ziel der Masterarbeit nennen.
- 3) Fragen, ob Aufzeichnung ok ist. Sagen, dass alle Daten zur Person und Firma anonymisiert werden.

Hintergrund zur Person

- 1) In welcher Rolle sind Sie aktuell bei Ihrer Firma tätig bzw. wie lautet Ihre Berufsbezeichnung?
- 2) Können Sie stichpunktartig Ihre Aufgaben umreißen?
- 3) Falls es sich nicht aus 1) oder 2) ergeben hat: Sind Sie als Angestellter oder in leitender Position tätig?
- 4) Wie lange sind Sie bereits in dieser Rolle in der Firma tätig?
- 5) Wie lange arbeiten Sie insgesamt bereits in der Firma?

Erfahrung mit Cloud Migration allgemein

- 1) Seit wie vielen Jahren haben Sie bereits beruflich mit dem Thema Cloud zu tun?
- 2) [OPTIONAL] An wie vielen Cloudprojekten haben Sie in Ihrer Firma mitgearbeitet?
- 3) High Level: Welche Funktion/Aufgaben hatten Sie bei Cloudprojekten (z.B. ausführend, organisatorisch/koordinativ, leitend, strategisch etc.)?
- 4) Können Sie kurz einige Beispiele für vergangene oder aktuelle Cloudprojekte geben?

Eckdaten zu Cloud im Unternehmen

- 1) Welche Cloud Provider nutzen Sie in Ihrer Firma?
- 2) Falls es sich nicht aus 1) ergeben hat: Verfolgen Sie eine Single Cloud/Vendor oder Multi Cloud/Vendor Strategie in Ihrer Firma?
- 3) Benutzen Sie ausschließlich Cloud oder eine Kombination aus Cloud und On-Premise?
- 4) Welche Service Models (z.B. IaaS, PaaS, SaaS, FaaS) sind in Ihrer Firma relevant?
- 5) Welche Deployment Models (z.B. Public, Private, Hybrid, Community) sind in Ihrer Firma relevant? (Achtung: Viele verstehen unter hybrid die Kombination aus Cloud und On-Premise)

Phase 2: inhaltliche Hauptphase (ca. 40 Minuten; Fokus je nach Interviewpartner)

BLOCK 1: STRATEGIE

- 1) Können Sie aus Ihrer Sicht die Cloudstrategie in Ihrem Unternehmen umreißen (z.B. Cloud-First, Cloud-Only etc.)?
- 2) Was sind die strategischen Ziele, die Sie mit der Umstellung auf die Cloud verfolgen bzw. was war die Motivation für den verstärkten Cloudeinsatz?
- 3) Falls es sich nicht aus 2) ergeben hat: Welche Vorteile haben Sie sich durch die Umstellung auf die Cloud erhofft?
- 4) Welchen Scope hat die Cloud Transformation/Migration (z.B. unternehmensweit, nur einzelne Bereiche, nur vereinzelte Daten und Anwendungen etc.)?
- 5) Wie weit sind Sie mit der Umsetzung schon?
- 6) War die Entscheidung zur Transformation/Migration eher Top-Down oder Bottom-Up?
- 7) Gibt es Reibungspunkte/Challenges zwischen Unternehmensstrategie und Cloudstrategie?
- 8) Gibt es in Ihrem Unternehmen eine einheitliche Cloudstrategie oder macht eher jeder Unternehmensbereich „sein eigenes Ding“?
 - Wenn ja, wie haben Sie die Einheitlichkeit sichergestellt (Cloud Leitfaden, Cloud Governance Framework, Strategiepapier etc.)?
 - Wenn nein: Was planen Sie zu tun, um die Strategie/Ansätze zu vereinheitlichen?
- 9) Welche Rolle spielen Strategieberatungen wie PwC, BCG usw. bei der Cloudstrategie?
- 10) Gibt es etwas, das Sie im Nachhinein anders machen würden bezogen auf die strategische Ausrichtung beim Thema Cloud oder gibt es konkrete Learnings auf strategischer Ebene?

BLOCK 2: PROZESSE TEIL 1: (Kern-) Geschäftsprozesse

- 1) In welchen Unternehmensbereichen setzen Sie Cloud-Services ein (z.B. Kerngeschäft, IT, administrative Bereiche wie HR, Finance usw.)
- 2) Falls es sich nicht aus 1) ergeben hat: Welche Fachbereiche sind Ihrer Meinung nach am stärksten von der Umstellung auf die Cloud betroffen (z.B. Kerngeschäft, IT, administrative Bereiche wie HR, Finance usw.)?
- 3) Gab es durch die Einführung der Cloud Änderungen an den Kern-Geschäftsprozessen Ihres Unternehmens?
 - Wenn ja: Welche bzw. Können Sie Beispiele geben (z.B. aus Sicht eines End Users oder Sachbearbeiters)?
 - Wenn nein: Warum nicht? Können Sie es näher erklären?
- 4) Mussten bestehende Prozesse im Zuge der Umstellung auf die Cloud geändert oder neu entwickelt werden (z.B. in der Produktion, Vertrieb, Personalwesen etc.)?
- 5) Welche Prozesse oder Arten von Prozessen haben Sie in die Cloud migriert und welche explizit nicht?
- 6) Gibt es bestimmte Prozesse, die durch die Einführung der Cloud nicht mehr gut funktionieren?
- 7) Konnten Sie durch die Cloud bestimmte Prozesse automatisieren?
- 8) Fördert der Einsatz der Cloud Agilität in Ihrem Unternehmen?

BLOCK 3: MITARBEITER, KULTUR UND KOMMUNIKATION

- 1) Haben sich durch die Cloud Änderungen an der Unternehmenskultur ergeben?
 - Falls Interviewpartner ein Beispiel braucht, was damit gemeint sein könnte: Liegt z.B. mehr Verantwortung beim Mitarbeiter, sich stetig anzupassen, da SaaS kürzere Release- und Updatezyklen hat?
- 2) Mussten Sie die Mitarbeiter überzeugen, auf die Cloud umzustellen, oder sind die meisten der Meinung, dass dies sinnvoll ist?
 - Wenn ja, wie haben Sie die Mitarbeiter überzeugt?
- 3) Können Sie ein Muster bzgl. Widerstand gegen die Cloud feststellen? Zum Beispiel, dass ältere Mitarbeiter eher Widerstand gegen Cloudadoption leisten als junge oder Fachbereiche mehr als IT-Mitarbeiter?
- 4) Welche Kommunikationsstrategien wurden verwendet, um Mitarbeiter über die Cloud-Migration zu informieren und einzubinden (z.B. regelmäßige Meetings, in denen das Management die Strategie erklärt, schriftliche Updates etc.)?
 - Würden Sie im Nachhinein etwas anders machen in Bezug auf die Kommunikation (z.B. Mehrwert der Cloud besser aufzeigen) oder hat es gut funktioniert?
 - Gibt es konkrete Learning in Bezug auf die Kommunikation? Was hat gut/schlecht funktioniert?
- 5) Mussten die Mitarbeiter neue Skills lernen?
 - Wenn ja, welche (konkrete Beispiele)?
- 6) Welche Rolle spielen Schulungen/Fortbildungen?
 - Welche Schulungsmöglichkeiten bieten Sie an (z.B. Udemy, Präsenzschulungen etc.)?
- 7) Wurde irgendeine Art Feedback-Mechanismus entwickelt (z.B. eine Umfrage), um zu verstehen, wie es den Mitarbeitern mit der Clouddumstellung geht?

BLOCK 4: UNTERNEHMENSORGANISATION

- 1) Gab es im Zuge der Cloud-Transformation/Migration Änderungen an der Unternehmensorganisation (z.B. neue Abteilungen, Stabstellen, CCoE usw.)?
 - Falls CCoE: Wie ist es besetzt, welche Rollen sind dort vertreten? Sind dort nur Techniker drin (z.B. Cloud Engineers), oder auch Manager oder Leute aus anderen Fachbereichen?
- 2) Wurden im Zuge der Cloud Transformation/Migration neue Rollen geschaffen?
 - Falls ja: Was sind deren Aufgaben bzw. warum werden die neuen Rollen gebraucht?
- 3) Würden Sie sagen, dass die bestehende Organisationsstruktur an manchen Stellen ein Hindernis für die Cloudtransformation darstellt (z.B., weil es zu wenig überfachliche Zusammenarbeit gibt oder Entscheidungswege zu lang sind)?
- 4) Wie haben sich Verantwortlichkeiten/Aufgaben von IT-Teams verändert (z.B. vom IT-Infrastruktur Team oder Entwicklerteams)?
- 5) Brauchen Sie durch die Umstellung auf die Cloud mehr, weniger oder gleich viele Fachkräfte?
 - Einmal beziehen auf Business-Fachkräfte und einmal auf IT-Fachkräfte
 - Falls Experte sich unsicher ist: Wurden schonmal aktiv Stellen abgebaut oder aufgebaut wegen der Cloud?
- 6) Haben Sie Probleme, geeignete IT- bzw. Cloud-Fachkräfte zu finden?
- 7) Welche Rolle spielen externe Partner (z.B. IT-Dienstleister wie Accenture) bei der Transformation/Migration?
 - Falls sie große Rolle spielen: nachhaken, warum nicht mehr in-house gemacht wird.
- 8) Gibt es etwas, das Sie im Nachhinein in Bezug auf die Unternehmensorganisation anders machen würden? Gibt es irgendwelche Learnings?

BLOCK 5: PROZESSE TEIL 2: Migrationsprozess

- 1) Haben Sie sich für die Transformation/Migration an einem bestehenden Vorgehensmodell orientiert (z.B. aus einem Buch, aus der Wissenschaft, Frameworks der Hyperscaler etc.) oder ist es eher ein selbstgebastelter Prozess?
- 2) Falls es sich nicht aus 1) ergeben hat: Wie haben Sie den Migrationsprozess strukturiert? Welche Phasen gibt es?
- 3) Ist ein Migrationsprozess in Ihrer Firma eher ein Wasserfall-Prozess oder ein agiler Prozess?
- 4) Welche Abteilungen und Rollen sind Ihrer Erfahrung nach in ein Migrationsprojekt involviert?
 - Nachfragen, was deren jeweilige Aufgaben/Verantwortlichkeiten sind.
- 5) Gibt es ein spezielles Prozessmodell, das Sie für die Migration anwenden (z.B. Scrum, Kanban etc.)?
- 6) Wie unterscheidet sich ein Cloudprojekt von klassischen IT-Projekten?
- 7) Gibt es bei der Migration bestimmte Hürden, die immer wieder auftauchen oder ist das Feld an Problemen sehr breit?
- 8) Falls es sich nicht aus 7) ergeben hat: Was sind die größten Hürden beim Migrationsprozess?
- 9) Wie tracken Sie den Fortschritt der Migration (z.B. mit bestehenden Projektmanagement Tools wie z.B. Jira und Excel oder gibt es spezielle Tools für Cloudprojekte)?
- 10) Wie haben Sie den Erfolg der Migration gemessen und bewertet? Gibt es relevante KPIs?

BLOCK 6: TECHNOLOGIE / INFRASTRUKTUR / ARCHITEKTUR

- 1) Haben Sie Migrationstools benutzt? Wenn ja, welche?
- 2) Was hat sich an Ihrer IT-Architektur verändert (z.B. mehr Microservices, SOA etc.)
- 3) Was hat sich an Ihrer IT-Infrastruktur verändert (z.B. Abbau von Rechenzentren)
- 4) Wie wurden bestehende Systeme und Anwendungen in die Cloud migriert? (Rehost, Refactor etc.)
- 5) Nach welchen Kriterien haben Sie spezifische Cloudprodukte und -Dienstleister ausgewählt?
- 6) Was waren die größten technischen Hürden bei der Migration?

Phase 3: Schluss

- 1) Gibt es etwas, das Sie noch anmerken möchten, worüber wir noch nicht gesprochen haben? Zum Beispiel eine konkrete Challenge, die man auf dem Schirm haben sollte, oder eine wichtige Best Practice, die bei Ihnen gut funktioniert hat?
- 2) Können Sie mir Dokumente/Präsentationen zum Thema Cloud zukommen lassen?
- 3) Haben Sie noch weitere Kontakte?
- 4) Bedanken für die Teilnahme.

Appendix C Memos

Appendix C.1 Memo 1 (Other Organizations)

Interview Nr.: 1

Datum: 02.02.2024

Dauer: 41 min

Channel: Google Meet

Firma (Pseudonym): keine Angabe notwendig, da nicht als Case verwertet

Branche: Luft- & Raumfahrt

Position/Rolle/Berufsbezeichnung: Senior Manager Cloud Services

Jahre in Rolle: 2

Jahre im Unternehmen: 5

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Cloud dort nutzen, wo es was bringt (administrative Bereiche)
- Nicht in Fertigung, da dort Prozesse zeitkritisch sind
- Operation Excellence
- SaaS als Entlastung für Mitarbeiter
- Digitale Zusammenarbeit; hybride Meetings

Challenges (vorläufig)

- Keine homogene Umsetzung, jeder Bereich macht sein „eigenes Ding“
- Blockadehaltung von Rechenzentrums-Administratoren ggü. Cloud
- Diverse Belegschaft: vom Fließbandarbeiter bis hin zu Kollegen mit doppeltem Doktortitel → unterschiedliche Anforderungen an IT und moderne Arbeitsweisen → schwierig, unterschiedliche Bedarfe abzudecken und Mittelweg zu finden
- Verstärkter Einsatz von Cloud stellt Herausforderung dar, da Gewohnheiten geändert werden müssen

Best Practices (vorläufig)

- Kein Lift & Shift → Prozesse und Systeme neu denken und neu bauen, alte Zöpfe abschneiden
- DevOps und Microservices pushen
- Vielschichtiges Schulungsangebot
- End-User begleiten
- Innerhalb IT: klares Zielbild, um es gemeinsam zu verfolgen

Sonstiges

- Keine Cloud in militärischem Bereich, Intellectual Property und Research & Development
- Neue Rollen werden durch Cloud geschaffen

Appendix C.2 Memo 2 (Other Organizations)

Interview Nr.: 2

Datum: 16.02.2024

Dauer: 44 min

Channel: Google Meet

Firma (Pseudonym): keine Angabe notwendig, da nicht als Case verwertet

Branche: IT

Position/Rolle/Berufsbezeichnung: Head of Cloud Development

Jahre in Rolle: 3

Jahre im Unternehmen: 21

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Top Management Attention
- Erkennen, dass Cloud weitreichendes Thema ist und nicht nur eine weitere neue Technologie
→ Wertschöpfungsketten ändern sich als IT-Dienstleister, vor allem wenn man nun SaaS anbietet
- Einheitliche Strategievorgabe
- Management für die Cloud sensibilisieren; Verständnis schaffen

Challenges (vorläufig)

- Heterogene Operationalisierung
- Heterogene Organisationsstruktur, viele verschiedene Legaleinheiten
- SaaS anzubieten ist vielschichtiger als klassische Softwareentwicklung, neue Wertschöpfung
- Vertriebler tun sich schwer, Cloud zu verkaufen, da sie selbst wenig Wissen darüber haben
- Organisatorische Transformation wurde descoped
- Change im Skillset der Entwickler
- Gemischtes Bild bzgl. Widerstand gegen die Cloud; Business Leute eher dagegen, Entwickler haben eher Lust auf Cloud
- Verschiedene Legaleinheiten zu orchestrieren ist herausfordernd
- „Wo bleibt der Umsatz“ Denkweise, wenn Mitarbeiter auf Schulung sind

Best Practices (vorläufig)

- An wissenschaftlichem Paper orientiert, um Wertstromketten zu definieren
- Cloud Center of Excellence (CCoE) geschaffen
- Schulungen und Zertifikate, um Mitarbeiter fortzubilden
- Alle Stakeholder in Designphase mit einbeziehen, um ihnen Angst zu nehmen

Sonstiges

- Erstmal keine beobachtbaren Änderungen an der Unternehmenskultur

Appendix C.3 Memo 3 (Other Organizations)

Interview Nr.: 3

Datum: 19.02.2024

Dauer: 45 min

Channel: Google Meet

Firma (Pseudonym): keine Angabe notwendig, da nicht als Case verwertet

Branche: IT

Position/Rolle/Berufsbezeichnung: Head of Cloud Engineering

Jahre in Rolle: 2,5

Jahre im Unternehmen: 6

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Awareness für Cloud schaffen; das „Warum“ erklären
- People Based Change-Management
- Cloud nicht als One-Off betrachten, sondern als kontinuierliche Transformation verstehen
- Unsicherheit adressieren

Challenges (vorläufig)

- CapEx vs OpEx: Cloud senkt CapEx und erhöht OpEx
- Battle for Attention in der Unternehmenskommunikation mit anderen Themen
- Freigabeprozesse hindern Innovation
- Fehlende Awareness
- Genereller Widerstand gegen Veränderungen gilt auch für Cloud Transformation

Best Practices (vorläufig)

- CCoE's als permanente Einheiten
- Schulungen, sowohl technisch als auch Awareness („Warum“ der Cloud erklären)
- Von oben nach unten kaskadieren bis zum einzelnen Mitarbeiter, und zwar immer wieder
- Psychologischer Aspekt: Mitarbeiter klarmachen, dass auch sein Wert steigt
- Erklären, welche Veränderungen und Möglichkeiten es für den einzelnen gibt
- Cross-funktionale Teams bilden

Sonstiges

- Sovereign Cloud
- Kosteneinsparungen als größter Treiber
- Kombination Project Lead + Program Lead

Appendix C.4 Memo 4 (MediaCorp)

Interview Nr.: 4

Datum: 23.02.2024

Dauer: 56 min

Channel: Microsoft Teams

Firma (Pseudonym): MediaCorp

Branche: Medien/Entertainment

Position/Rolle/Berufsbezeichnung: Senior Vice President Information Technology Infrastructure

Jahre in Rolle: 3,5

Jahre im Unternehmen: 3,5

leitende Funktion: ja

Erfolgsfaktoren (preliminary)

- Cloud Operating Model: definiert, wie man mit der Cloud Wert schafft und was man tun will
- Cloud Governance Framework: definiert, wie man es tun will
- Infrastrukturstrategie ist wichtiger als Cloudstrategie
- Cloud als Mittel zum Zweck sehen
- Fokussierung auf Business
- Im Mediensektor wird eigenes Rechenzentrum immer wichtig bleiben

Challenges (preliminary)

- Auf Technologie wie Cloud festlegen bzw. dogmatisches Cloud-First ist Unsinn
- Erste Steps mit Cloud waren chaotisch
- Altes Management war gegen Cloud
- Besonderheiten im Mediensektor, z.B. Latenzzeiten bei TV-Produktionen, erlauben keinen Cloudeinsatz
- Ripple Effekt → Auswirkungen der Cloud auf verschiedenste organisatorische Bereiche

Best Practices (preliminary)

- 2 Cloud Units: CCoE für Governance und Operational Units
- Moderne On-Premise Technologien nutzen, wenn sie zur Verfügung stehen
- Cloud nicht als Dogma sehen
- Team Augmentation mit externen Dienstleistern
- Fokus auf einen Cloudanbieter, da sonst Transformation zu komplex ist

Sonstiges

- Keine Strategieberatungen für Cloud Themen
- Modernste On-Premise Technologien stehen zur Verfügung
- Ob Migration eher Wasserfall oder agil ist, hängt vom R ab (Rehost → Wasserfall; Refactor → agil)

Appendix C.5 Memo 5 (InsuCorp)

Interview Nr.: 5

Datum: 23.02.2024

Dauer: 48 min

Channel: Google Meet

Firma (Pseudonym): InsuCorp

Branche: Versicherungen & Finanzen

Position/Rolle/Berufsbezeichnung: Global Head of Data Management Platforms

Jahre in Rolle: 3

Jahre im Unternehmen: 10

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Einhaltung von Global Architecture Blueprints
- Business Cases wirklich genau durchrechnen
- Cloud nicht als Dogma verwenden

Challenges (vorläufig)

- Für internationale Kollegen werden viele Ausnahmen (Exception Process) gemacht
- Stark regulierte Branche; unterschiedliche Regulierung in den jeweiligen Ländern
- Vorstand lässt sich nicht auf agile Arbeitsweise ein
- Migrationsaufwand wird häufig unterschätzt
- Fachkräftemangel; Jobs werden immer komplexer
- Fachkräfte mit End-to-End Verständnis sind selten und haben hohe Gehaltsansprüche
- Cloud erzeugt Erwartungshaltung, dass alles immer schneller geht → das erzeugt Druck

Best Practices (vorläufig)

- Konsequenz, Effizienz, Vereinheitlichung anstatt viele Ausnahmen von Blueprints
- An Praxisbeispielen orientieren statt an Strategieberatungen für Umsetzung
- Kleine Spezialfirmen sind gewinnbringender als Accenture etc.
- Mitarbeitern Zukunft aufzeigen, Einzelgespräche

Sonstiges

- Einfache Jobs fallen weg
- Standortrisiko, Konzentration

Appendix C.6 Memo 6 (Other Organizations)

Interview Nr.: 6

Datum: 27.02.2024

Dauer: 30 min

Channel: Google Meet

Firma (Pseudonym): keine Angabe notwendig, da nicht als Case verwertet

Branche: IT

Position/Rolle/Berufsbezeichnung: Senior Consultant Digital Transformation

Jahre in Rolle: 1,5

Jahre im Unternehmen: 1,5

leitende Funktion: nein

Erfolgsfaktoren (vorläufig)

- Vertrauen der Führungskräfte in die Cloud
- Akzeptanz, vor allem der Führungskräfte
- Kommunikation bei der Cloudmigration

Challenges (vorläufig)

- Vor allem für konservative Unternehmen ist Cloud ein großer Change
- Mindset Change, der Cloud zu vertrauen
- Initial wenig Akzeptanz bzw. Vertrauen in die Cloud

Best Practices (vorläufig)

- Überzeugungsarbeit leisten
- Bei Top Management beginnen
- Vorteile der Cloud aufzeigen
- Viele Kommunikationskanäle nutzen
- Feedback: People Readiness Check
- Stakeholder Analyse, Change Impact Analyse

Sonstiges

- Für nicht-IT Mitarbeiter ergibt sich keine große Veränderung im täglichen Doing
- Cloud hat wenig Einfluss auf Agilität

Appendix C.7 Memo 7 (SoftwareCorp)

Interview Nr.: 7

Datum: 27.02.2024

Dauer: 51 min

Channel: Google Meet

Firma (Pseudonym): SoftwareCorp

Branche: Software/IT

Position/Rolle/Berufsbezeichnung: Head of ITSM Development

Jahre in Rolle: 7

Jahre im Unternehmen: 30

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Migration als Chance nutzen, bisherige Prozesse zu untersuchen
- Harmonisierung
- nah am Standard bleiben

Challenges (vorläufig)

- Breites Set an Challenges, die auftauchen können
- Widerstand gegen Migration: Demografische Unterschiede

Best Practices (vorläufig)

- Bezuglich Prozesse neu denken: „alte Zöpfe abschneiden“
- Business Process Consultants: interne und externe
- Widerspenstige Mitarbeiter auf alter Infrastruktur lassen, solange sie noch parallel läuft

Sonstiges

- Daten-Ownership, Vertrauen
- Geben und Nehmen mit ServiceNow
- Ausgeprägteres Rollenkonzept in ServiceNow

Appendix C.8 Memo 8 (SoftwareCorp)

Interview Nr.: 8

Datum: 28.02.2024

Dauer: 49 min

Channel: Google Meet

Firma (Pseudonym): SoftwareCorp

Branche: Software/IT

Position/Rolle/Berufsbezeichnung: IT-Manager

Jahre in Rolle: 5

Jahre im Unternehmen: 25

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Nicht das Rad neu erfinden, Erfahrungen von on-Premise Lösung einbringen
- Mitarbeitern Zeit geben, mitnehmen, anderes Mindset
- Feedback einholen

Challenges (vorläufig)

- Wo liegen die Daten (Vertrauen, Datenownership)
- Andere Sprache/Begrifflichkeiten als Cloudanbieter
- Widerstand der Mitarbeiter ggü. ServiceNow: „Ich will eigene Software machen“
- Fehlender Einblick, z.B. bei Monitoring
- Need, Cloud Provider nachzukontrollieren

Best Practices (vorläufig)

- MVP bauen
- Einzelgespräche, falls Mitarbeiter Widerstand gegen ServiceNow zeigen
- Interne Wechsel zulassen/ermöglichen
- Feedbackmechanismen einsetzen: Usability Tests usw.

Sonstiges

- Geben und Nehmen mit ServiceNow: SoftwareCorp ist Kunde von ServiceNow und ServiceNow ist Kunde von SoftwareCorp

Appendix C.9 Memo 9 (MediaCorp)

Interview Nr.: 9

Datum: 29.02.2024

Dauer: 40 min

Channel: Microsoft Teams

Firma (Pseudonym): MediaCorp

Branche: Medien/Entertainment

Position/Rolle/Berufsbezeichnung: Head of Datacenter and Cloud Solutions

Jahre in Rolle: 4

Jahre im Unternehmen: 10

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Arbeitsentlastung durch Cloud
- Zeit, um sich mit Cloud zu beschäftigen
- Kommunikation in den Projektteams

Challenges (vorläufig)

- Infrastruktur ist noch nicht so weit bei der Umsetzung der Transformation, Software Development Teams sind schon weiter
- Anfangs hat jeder sein eigenes Süppchen gekocht beim Thema Cloud
- Mitarbeiter in der Infrastruktur haben Lust, aber keine Zeit sich mit Cloud zu beschäftigen
- Fehlende Kommunikation bei Cloud Projekten
- Fachkräftemangel erhöht Belastung

Best Practices (vorläufig)

- Cloud Core Team in Infrastrukturbereich, um Handlungen zu koordinieren
- Synergien zwischen Cloud Experten und On-Premise Experten ermöglichen
- Upskilling der Mitarbeiter ermöglichen → breites Schulungsangebot bereistellen
- Automatisierung, um Arbeitsentlastung zu ermöglichen, und so Zeit schaffen, sich mit der Cloud zu beschäftigen
- Lessons Learned Format nach abgeschlossenem Projekt
- Protokoll führen

Sonstiges

- MediaCorp ist sehr kostengetrieben und muss die einzelnen Cases genau bewerten
- Softwareentwickler sind von Cloud stärker betroffen als Infrastruktur Mitarbeiter
- Branchenspezifische Software läuft nicht in der Cloud

Appendix C.10 Memo 10 (Other Organizations)

Interview Nr.: 10

Datum: 04.03.2024

Dauer: 41 min

Channel: Google Meet

Firma (Pseudonym): keine Angabe notwendig, da nicht als Case verwertet

Branche: Öffentliche Verwaltung

Position/Rolle/Berufsbezeichnung: Senior IT Architekt

Jahre in Rolle: 10

Jahre in Behörde: 11

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Commitment vom Top Management
- Mindset Change: IT von Anfang an mitdenken
- Commitment zu Agilität
- Prozesse challengen im Zuge der Transformation
- Zielgerichtete Kommunikation

Challenges (vorläufig)

- Viele Legacy Systeme
- Demografischer Wandel → viele Mitarbeiter werden in den kommenden Jahren in Rente gehen
- Schwer, Personal zu finden als öffentliche Verwaltung
- Hohe gesetzliche Auflagen zu Themen wie Datenschutz, die eingehalten werden müssen

Best Practices (vorläufig)

- Vorgabe, Cloud-nah zu entwickeln
- CCoE gegründet
- Von einer Plan-Build-Run Organisation zu einer DevSecOps Organisation
- Verstärkt Microservices einsetzen
- Human Friendly Automation

Sonstiges

- Seit einige Jahren ist eine On-Premise private Cloud im Einsatz
- IaaS ist nicht relevant, aber vor allem SaaS
- Gerade in Planungsphase/Anfangsphase der Cloud Transformation
- Cloud-Personal ist leichter zu bekommen als Personal das Legacy Tools kennt
- Bestimmte Prozesse können nicht in die Cloud, z.B. Auszahlungsprozesse

Appendix C.11 Memo 11 (MediaCorp)

Interview Nr.: 11

Datum: 05.03.2024

Dauer: 45 min

Channel: Microsoft Teams

Firma (Pseudonym): MediaCorp

Branche: Medien/Entertainment

Position/Rolle/Berufsbezeichnung: Geschäftsführer der Enterprise IT Firma → quasi CIO

Jahre in Rolle: 3

Jahre im Unternehmen: 3

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Mittelweg zwischen Sicherheit und Kosten finden
- Kernprozesse im Zuge der Transformation analysieren
- Change-Management
- Weiterbildung

Challenges (vorläufig)

- Große Datenmengen (Content) sind teuer in der Cloud → kontinuierliche Verhandlungen mit Vendor
- Cloud reduziert CapEx und erhöht OpEx geht hoch → erstmal schlechteres Betriebsergebnis durch Cloud
- Fachkräftemangel
- MediaCorp hat nicht die Manpower, um mit mehr als einem Vendor zu arbeiten

Best Practices (vorläufig)

- Cloud Assessment Projekt
- Fachkräfte nicht mit Commodity beschäftigen, die man in der Cloud out-of-the-Box bekommt
- Neuentwicklungen cloudbasiert machen
- Mehrwert der Cloud kommunizieren
- Mitarbeiter ausprobieren & erleben lassen
- Breites Schulungsangebot
- Cloud Enablement Team, Cloud Core Team und Cloud Kompetenz Team bilden
- Interessante Projekte Mitarbeiter machen lassen, weniger Interessante (z.B. Datenaufbereitung) externe Dienstleister machen lassen

Sonstiges

- Im Medienumfeld wird es immer eine Kombination aus On-Premise und Cloud sein
- Cloud fördert Agilität

Appendix C.12 Memo 12 (MediaCorp)

Interview Nr.: 12

Datum: 07.03.2024

Dauer: 43 min

Channel: Microsoft Teams

Firma (Pseudonym): MediaCorp

Branche: Medien/Entertainment

Position/Rolle/Berufsbezeichnung: Head of Data Platforms

Jahre in Rolle: 2

Jahre im Unternehmen: 2

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Veränderte Arbeitsweise, weg von Betrachtung der Durchschnittslast im Datenumfeld
- Kommunikation bei der Transformation
- Weiterbildung
- Verbindung von Theorie und Praxis

Challenges (vorläufig)

- Uneinheitliche Umsetzung in verschiedenen Bereichen, da sie unterschiedlich weit sind
- Wenig Reibungspunkte im Zielbild der Transformation, jedoch viele Hürden in der Umsetzung
- Fehlende Kommunikation ist historisch bedingt
- Mitarbeiter haben besonders dann Widerstand, wenn Mehrwert der Cloud nicht klar ist
- Banale Kostenbetrachtung zieht nicht, wenn es um die Cloud geht

Best Practices (vorläufig)

- Bewusstsein schaffen: wer macht was in der Cloud
- Cloud Experten innerhalb der Firma vernetzen
- Mehrwert der Cloud kommunizieren
- Verschiedenste Kommunikationswege bespielen
- Mehrwert erlebbar machen und die Mitarbeiter ausprobieren lassen, dann macht es „Klick“
- Breites Schulungsangebot

Sonstiges

- Alles im Datenumfeld in der Cloud liegt bei dem Experten
- Cloud First; Cloud Only wird als Medienfirma vermutlich nie möglich sein
- Kosten sind in der Cloud transparenter: wer verursacht was
- Mitarbeiter haben mehr Möglichkeiten durch die Cloud, aber auch mehr Verantwortung

Appendix C.13 Memo 13 (InsuCorp)

Interview Nr.: 13

Datum: 10.03.2024

Dauer: 53 min

Channel: Google Meet

Firma (Pseudonym): InsuCorp

Branche: Versicherungen & Finanzen

Position/Rolle/Berufsbezeichnung: Softwarearchitekt

Jahre in Rolle: 1,5

Jahre im Unternehmen: 20

leitende Funktion: fachlich, nicht disziplinarisch

Erfolgsfaktoren (vorläufig)

- Compliance zur Regulatorik
- Business Understanding von IT-Mitarbeitern
- Orientierung am Business Case; Cloud nicht dogmatisch verwenden
- Branchenspezifische Requirements erfüllen

Challenges (vorläufig)

- Cloud Provider bieten nicht wirklich das, was Regulatoren fordern → viele manuelle Anpassungen und Erweiterungen sind notwendig
- Es gibt viele alte Produkte, die nicht mehr verkauft werden, aber noch weiterlaufen → damit verdient InsuCorp kein Geld
- Legacy Systeme sind in alten Programmiersprachen, die nicht in der Cloud laufen → Migrationen sind oft sehr komplex
- Langfristigkeit der Produkte, z.B. Versicherungen
- Cloud ist permanentes Thema, es gibt keinen Projektabschluss
- Kompliziertere Abhängigkeiten als On-Premise mit weniger Kontrolle

Best Practices (vorläufig)

- Migration nicht technisch betrachten, sondern auf Business-Level
- Cloud nicht als Dogma sehen, sondern prüfen: Passt der Use Case zur Cloud?
- IT-Mitarbeiter auch Business verstehen/lernen lassen
- Roadblocker bei Projekten früh herausfinden
- MVPs bauen; fail fast Ansatz; kritische Road Blocker früh identifizieren
- Jeden Use Case einzeln betrachten, ob Cloud dafür geeignet ist

Sonstiges

- Cloud First Strategie

Appendix C.14 Memo 14 (MediaCorp)

Interview Nr.: 14

Datum: 13.03.2024

Dauer: 46 min

Channel: Microsoft Teams

Firma (Pseudonym): MediaCorp

Branche: Medien/Entertainment

Position/Rolle/Berufsbezeichnung: Vice President Corporate Holding Solutions

Jahre in Rolle: 2

Jahre im Unternehmen: 8

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Überzeugungsarbeit bei der Transformation
- Change Affinität
- Commitment von Stakeholdern zur Cloud
- Abhängigkeit von Vendor

Challenges (vorläufig)

- Historisch ist MediaCorp eine On-Premise Firma; erst relativ spät in Cloud eingestiegen
- Heterogene Umsetzung → verschiedene Bereiche sind unterschiedlich weit
- CapEx vs OpEx: Cloud reduziert CapEx und erhöht OpEx
- Mitarbeiter verlieren teilweise ihren USP durch die Cloud
- Mitarbeiter verlieren teilweise Spaß an Arbeit, da die Cloud den interessanten Teil übernimmt
- Automatisierung durch die Cloud: Lücke zwischen Versprechung und Realität

Best Practices (vorläufig)

- Transparenz und Kommunikation zu Kostenarten (CapEx vs OpEx)
- Direkt auf Vendor zugehen bei Problemen
- Bei Verhandlungen mit Vendor selbstbewusst auftreten; klarmachen, dass man nicht abhängig von ihm ist

Sonstiges

- Migration im Bereich des Experten bedeutet fast immer Wechsel auf SaaS
- MediaCorp sind Getriebene, weil Hersteller oft bestimmte Funktionalitäten nur in der Cloud-version anbieten
- End User merkt wenig von Wechsel zu SaaS
- Cloud fördert tendenziell Agilität

Appendix C.15 Memo 15 (MediaCorp)

Interview Nr.: 15

Datum: 11.03.2024

Dauer: 35 min

Channel: Microsoft Teams

Firma (Pseudonym): MediaCorp

Branche: Medien/Entertainment

Position/Rolle/Berufsbezeichnung: Cloudarchitekt

Jahre in Rolle: 2

Jahre im Unternehmen: 7

leitende Funktion: nein

Erfolgsfaktoren (vorläufig)

- Mehr Automatisierung, Cloud als Enabler für Automatisierung
- Agilität
- Weiterbildung

Challenges (vorläufig)

- Jeder Bereich macht sein eigenes Ding, da Kenntnisstände unterschiedlich sind (manche haben früher angefangen) und Führungskräfte die Cloud unterschiedlich stark gepushed haben
- Koordination der verschiedenen Cloud Teams (Cloud-Kompetenz Team, Cloud Core Team, Cloud-Enablement Team) ist verbessерungsbedürftig
- Skillset ändert sich komplett, wenn man von On-Premise Welt kommt

Best Practices (vorläufig)

- Cloud Assessment Projekt, um zu prüfen, ob Systeme geeignet sind für die Cloud
- Slacktime: 20 % der Arbeitszeit für Fortbildung
- Breites Schulungsangebot bereitstellen inkl. praktischen Möglichkeiten, Dinge in der Cloud auszuprobieren (z.B. AWS Playground)
- Agilere Arbeitsweise durch die Cloud

Sonstiges

- Mehr CI/CD im Zuge der Cloud Transformation
- Mehr Containerisierung anstatt Virtuelle Maschinen
- Migrationstools ausprobiert; werden wenig genutzt
- Konnte nichts zu Haltung der Mitarbeiter ggü. Cloud sagen
- Konnte nichts zu Geschäftsprozessen sagen
- Konnte keine strategischen Konflikte nennen

Appendix C.16 Memo 16 (Other Organizations)

Interview Nr.: 16

Datum: 15.03.2024

Dauer: 36 min

Channel: Microsoft Teams

Firma (Pseudonym): keine Angabe notwendig, da nicht als Case verwertet

Branche: Öffentliche Verwaltung

Position/Rolle/Berufsbezeichnung: Senior IT Berater

Jahre in Rolle: 1,5

Jahre in Behörde: 16

leitende Funktion: keine Information

Erfolgsfaktoren (vorläufig)

- Smoothe Transition für nicht-IT Mitarbeiter (z.B. Sachbearbeiter) → sollen von Cloudeinsatz weitestgehend nichts merken in ihrer täglichen Arbeit
- Vendor Lock-in sollte vermieden werden

Challenges (vorläufig)

- Verfügbare Personalkapazitäten knapp, da demografischer Wandel im Gange ist, allgemeiner Fachkräftemangel herrscht und die Behörde nicht mit Gehältern in der freien Wirtschaft konkurrieren kann
- Rechtskonformität muss gewahrt werden; Arbeit mit sensiblen Daten erfordert besondere Achtsamkeit
- Bestimmte Prozesse und Daten sind in der Cloud für die Behörde nicht denkbar
- IT-Mitarbeiter teilweise sehr konservativ → Widerstand ggü. der Cloud
- Sprachliche Barriere in Zusammenarbeit mit Cloud-Dienstleistern → wenig Akzeptanz, englisch zu sprechen (sogar seitens der IT-Mitarbeiter)
- Cloud wird aktuell in der Behörde „gehyped“

Best Practices (vorläufig)

- Human Friendly Automation
- CCoE bilden
- Primär IT-Prozesse überarbeiten, Geschäftsprozesse nur sekundär

Sonstiges

- Seit mehreren Jahren gut funktionierende, selbst betriebene private Cloud im Einsatz
- Nicht-IT Mitarbeiter (z.B. Sachbearbeiter) haben kaum Widerstand gegen Cloud bzw. keine Meinung dazu; benutzen Cloud oft, ohne es eigentlich zu dürfen (z.B. Deepl, um Dokumente zu übersetzen)

Appendix C.17 Memo 17 (InsuCorp)

Interview Nr.: 17

Datum: 19.03.2024

Dauer: 44 min

Channel: Google Meet

Firma (Pseudonym): InsuCorp

Branche: Versicherungen & Finanzen

Position/Rolle/Berufsbezeichnung: IT Service Managerin

Jahre in Rolle: 3

Jahre im Unternehmen: 5

leitende Funktion: fachlich, nicht disziplinarisch

Erfolgsfaktoren (vorläufig)

- Weiterbildung ermöglichen
- Cloud Expertise

Challenges (vorläufig)

- Fachkräftemangel: teilweise ist man in der täglichen Arbeit komplett blockiert, weil Expertise fehlt
- Weniger Einfluss in der Cloud als On-Premise; Kontrollverlust
- Weniger Stellen zur Verfügung, um die Arbeit zu schaffen
- Kulturveränderung: weniger Miteinander
- Expertise verloren, Abhängigkeit von Anbieter generiert
- Keine Priorität bei Vendor bei Anfragen/Problemen

Best Practices (vorläufig)

- Breites Angebot an Schulungen bereitstellen

Sonstiges

- Arbeit der Sachbearbeiter im Kerngeschäft wird leichter

Appendix C.18 Memo 18 (SoftwareCorp)

Interview Nr.: 18

Datum: 28.03.2024

Dauer: 44 min

Channel: Google Meet

Firma (Pseudonym): SoftwareCorp

Branche: Software/IT

Position/Rolle/Berufsbezeichnung: Head of IT Service Management

Jahre in Rolle: 5

Jahre im Unternehmen: 25

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Prozesse überdenken
- Harmonisierung
- Mandat von ganz oben (Topmanagement) sehr wichtig
- Unterfangen bzw. Tragweite der Migration nicht unterschätzen
- Nähe zum Standard

Challenges (vorläufig)

- „Not invented here“ Syndrom
- Man kann nicht direkt auf die Leute zugehen, da Umfrage zu ServiceNow anonym ist
- Mitarbeiter lesen Doku nicht
- Schwierig, erfahrene ServiceNow Fachkräfte zu finden; keine Kapazitäten, um Berufsanfänger auszubilden
- Viel Aufwand in Change-Management und Kommunikation stecken, um Mitarbeiter zu begleiten
- Mehr Verantwortung beim User; Zeit zum Stillstehen ist vorbei; kontinuierliches Anpassen ist notwendig

Best Practices (vorläufig)

- UX Light Umfrage, um Feedback zu ServiceNow zu bekommen
- Onboarding, Change-Management
- UI auf verschiedene Usergruppen zuschneiden
- MVP bauen
- Process Leads, um Prozesse zu überdenken

Sonstiges

- In gewissen Bereichen ist ServiceNow Konkurrent

Appendix C.19 Memo 19 (MediaCorp)

Interview Nr.: 19

Datum: 04.04.2024

Dauer: 45 min

Channel: Microsoft Teams

Firma (Pseudonym): MediaCorp

Branche: Medien/Entertainment

Position/Rolle/Berufsbezeichnung: Head of Platform Engineering and Operations

Jahre in Rolle: 3

Jahre im Unternehmen: 7

leitende Funktion: ja

Erfolgsfaktoren (vorläufig)

- Kommunikation des Mehrwertes der Cloud
- Firmenkontext bei Cloudmigrationen klarmachen
- Change-Management bei der Cloudtransformation
- Zuerst Kostentransparenz durch die Cloud schaffen, dann Kostenreduktion

Challenges (vorläufig)

- Management hat lange Cloud ausgeschlossen; inzwischen Managementwechsel
- Opportunitätskosten lassen sich kaum erfassen → Business Cases schwer zu rechnen
- Mehrere gescheiterte Cloudstrategien in der Vergangenheit
- „Wir gegen die“ Mentalität innerhalb der Firma
- Organisationsstruktur bedingt, dass kein Team ein Projekt alleine fertigstellen kann
- Technische Details sind bei Migrationsprojekten oft komplexer als gedacht

Best Practices (vorläufig)

- Konzentration auf einen Vendor (AWS), da sonst zu hohe Komplexität
- Mehrwert der Cloud kommunizieren
- Herausforderungen der Cloud kommunizieren
- Cloud-Enablement Team gründen, um anderen das nötige Wissen mitzugeben

Sonstiges

- Cloud ermöglicht Flexibilität
- On-Premise Server zu bekommen dauert mehrere Monate
- Grundlegende Setup Arbeit für Enterprise Cloud Benutzung ist nicht zu unterschätzen

Appendix C.20 Memo 20 (SoftwareCorp)

Interview Nr.: 20

Datum: 02.05.2024

Dauer: 49 min

Channel: Google Meet

Firma (Pseudonym): SoftwareCorp

Branche: Software/IT

Position/Rolle/Berufsbezeichnung: Senior ServiceNow Plattform Architekt

Jahre in Rolle: 1

Jahre im Unternehmen: 1

leitende Funktion: fachlich, nicht disziplinarisch

Erfolgsfaktoren (vorläufig)

- Einstellung zu Cloud: 2 Sichtweisen: Verantwortlichkeiten abgeben im Sinne von Arbeitserleichterung oder im Sinne von weniger Kontrolle und eigene Entscheidungen
- ServiceNow CoE (Center of Excellence)
- Onboarding von neuen Units: Value Communication

Challenges (vorläufig)

- Hohe Komplexität (230 aktive Integrationen)
- Politische Dimension, Themen müssen oft eskaliert werden
- 3 Gründe für Widerstand: „Not invented here“ Syndrom, vereinzelte Performance Probleme, ältere Generation glaubt nicht so stark an Cloud wie jüngere
- Politisch motivierte Streitigkeiten über Tools
- Kommunikation mit Cloud Provider ist oft schwer, man hat wenig Einsicht, gibt Kompetenzen ab
- ServiceNow Dokumentation bei neuen Tools/Features oft nicht ausreichend
- Man ist angewiesen auf Supportmitarbeiter von ServiceNow
- Sie bringen ServiceNow oft an Grenzen, da sie Frontrunner bzw. einer der größten Kunden sind → Lösungen von ServiceNow kommen dann zu spät, man muss eigene Workarounds bauen

Best Practices (vorläufig)

- Change-Management
- Program-Management, Priorisierung
- Key Rollen im eigenen Unternehmen besetzen, um Wissen zu behalten, wenn externe Partner weg sind
- Abstimmung und Kommunikation als wesentliche Aufgaben
- Value Communication ist Key, da es für LoBs eine Migration erstmal nur Arbeit ist
- Chance nutzen, Prozesse zu überdenken

Sonstiges

- Bestrebungen, auch intern immer mehr auf Cloud zu setzen, nicht nur nach außen hin
- Motivation der Einführung: Harmonisierung

Appendix D Code System

Appendix D.1 Selective Code #1

Selective Code #1: Background Information on Experts and Cloud Situation in Organization			
Axial Codes	Examples of Open Codes	Associated Text Segment	Source
Background of the Experts	Job Title	"Also ich nenne mich Head of Data Management Platforms und als solches sozusagen global verantwortlich für alle Software, die irgendwas mit Datenanalyse oder mit Datenspeicherung zu tun hat."	E5: 4
	Job Description	"Kann ich machen. Ich kümmere mich darum, dass Software-Entwicklungsteams leicht an Infrastruktur kommen, die sie brauchen, um ihre Applikationen laufen zu lassen. Das heißt, Self-Service, applikationsgetriebene Infrastruktur, dynamische Infrastruktur bereitstellen."	E19: 6
	Years in Organization	"Ja, das ist richtig. Ich arbeite bei [Firmenname] schon seit 30 Jahren. Hauptsächlich im IT-Service-Management oder Customer-Service-Management."	E7: 5
Overview of Cloud Situation in Organization	Cloud-First Strategy	"Also grundsätzlich ist es eine Cloud-First-Strategie. Cloud-Only wird nicht funktionieren."	E11: 16
	Multi-Cloud Strategy	"Und ja, also Cloud-First basierend auf Multi-Cloud und es gibt auch sogenannte Domains, wo ein Provider führend ist [...]"	E5: 27
	Hybrid Between Cloud and On-Premise	"Mittlerweile würde ich uns als eine ... ich würde die Cloudstrategie als Hybrid bezeichnen, also dass wir sagen, wir werden auch dauerhaft on-premise und Cloud nutzen."	E14: 20

Appendix D.2 Selective Code #2

Selective Code #2: Strategic Factors			
Axial Codes	Examples of Open Codes	Associated Text Segment	Source
Drivers and Benefits of Cloud Adoption	Some Products Are Not Offered On-Premise Anymore	"Wir haben zwei bis drei Vorteile, aber auch ein Grund. <u>Wir sind natürlich auch Getriebene, damit würde ich anfangen.</u> Manche Produkte werden einfach on-premise nicht mehr zur Verfügung gestellt. Zum Beispiel ein <u>Skype, Vorgänger von Microsoft Teams wird on-premise nicht mehr bereitgestellt.</u> Da brauchen wir Ersatzprodukte und die befinden sich <u>hälfig in der Cloud.</u> "	E1: 23
	Cloud Offers Scalability	"Was ist der Beweggrund gewesen, letztendlich, dass wir in die Cloud gehen: es sind mehrere Faktoren. Also natürlich die Standards, die wir halt so kennen, <u>dass ich in der Cloud skalierbarer bin [...]</u> "	E11: 12
	Cloud Offers Fast Time to Market	"Also, wann setzt du auf Cloud-Technologie? <u>Du hast natürlich im Cloud-Umfeld Vorteile, die du im Rechenzentrum nicht hast.</u> Das heißt, du bist <u>extrem schnell, also eine extrem geringe Time-to-Market.</u> "	E4: 39
Cloud Governance and Strategic Considerations	Identity and Access Management Is Part of Governance Framework	"Da hast du aber auch ganz klassische Governance-Themen da drin, die du normalerweise in so einem Governance-Framework ablegst. <u>Also zum Beispiel, wie mache ich Identity and Access Management?</u> "	E4: 55
	Deviation From Blueprint Requires Exception Process	"Ja, und <u>wenn da irgendeiner sagt: "Nein das mache ich aber nicht, weil das ist mir zu teuer"</u> oder sonst was, dann muss er das begründen und braucht <u>einen Exception-Prozess.</u> "	E5: 35
	Aspiration to Purchase Off-the-Shelf Software Instead of Developing In-House	" <u>Dass wir auch in der IT-Services, die halt sozusagen standardmäßig auf dem Markt gibt, nicht mehr selber erbringen, sondern dann einfach einkaufen können.</u> Also eine klare Entscheidung zu Make-Or-Buy."	E10: 26
Financial and Business Model Implications	Cloud Offers Higher Cost Transparency	"Du hast eine viel größere Kostentransparenz. Du kannst die Kosten viel besser monitoren. Du kannst dir Dinge zu Nutze machen, wie die Economies auf Scale, dass du dir Preisnachlässe mitnimmst."	E4: 39
	Cloud Reduces CapEx and Increases OpEx	"Das heißt, ein Shift von CapEx zu OpEx ist für so eine Firma eigentlich eher unschön. Gehe ich aber in die Cloud, mache ich genau das. Das heißt, ich <u>investiere nicht mehr in Hardware, sondern ich kaufe mir die Leistung in der Cloud zu.</u> Das heißt, das ist kein CapEx mehr, sondern es ist OpEx."	E11: 14
	Cloud Opens up New Business Models	"[...] und nicht nur für die, die da irgendwas entwickeln im Keller, dass sich plötzlich die Wertschöpfungsketten ändern, <u>dass völlig neue Geschäftsmodelle auftreten, mit diesen ganzen as a Service-Geschäftsmodellen [...]</u> "	E2: 29
Industry-Specific Factors	Different Regulations in Different Countries	"Und bei uns ist es halt so, ja, okay, ich verstehe es, <u>das ist eine regulierte Wirtschaft, die Versicherungswirtschaft und da gibt es Regulationen, die halt in China anders sind als bei uns,</u> aber dass man überall auch bei den Tools dann nachgibt, das verstehe ich nicht."	E5: 39
	Adjustments Necessary to Comply to Regulation	"[...] und was die Cloud-Provider liefern, kommt halt nicht so raus, wie sich das der Regulator vorstellt. <u>Und diese ganzen Anpassungen, Erweiterungen und so weiter müssen wir halt machen, um die nötige Compliance als systemrelevanter Player in der Finanzindustrie zu erfüllen.</u> "	E13: 18
	Streaming Requires Content to Be in the Cloud	"Aber ganzheitlich, wenn ich sage, okay, ich will die Applikationslandschaft in die Cloud schieben, <u>die ganze Medienlandschaft geht ja mehr Richtung Streaming.</u> Das heißt, das ist ja alles aus der Cloud heraus. Muss ich quasi die <u>ganze Technologie, die ich habe, zwangsläufig in die Cloud verschieben, und dann gehört natürlich auch der Content dazu.</u> "	E11: 14

Appendix D.3 Selective Code #3

Selective Code #3: People-Based Factors			
Axial Codes	Examples of Open Codes	Associated Text Segment	Source
Attitude Towards Cloud	Employees Using the Cloud Solution Regularly Are More Satisfied	"Leute, die gelegentlich die Software nur nutzen, sind tendenziell unzufriedener als Leute, die da jeden Tag drin sind. Das sind so die wahrscheinlich Haupt-Findings, die wir aus diesem Survey gezogen haben. Ich glaube, die, die jeden Tag das als Haupt-Tool benutzen, also unsere Support-Mitarbeiter, sind deutlich zufriedener. Wenn man sich damit mal zurechtgefunden hat."	E18: 39
	General Openness Towards Cloud	"Und natürlich schon so ein bisschen so, das war, wenn das wegfällt, dann muss ich andere Sachen machen, die machen mir nicht so viel Spaß wie das. Aber ansonsten herrscht da schon eine große Offenheit und eigentlich eher die Hoffnung auf Vereinfachung."	E14: 64
	Resistance Arises From Not Seeing Added Value	"[...] da war am Anfang original niemand happy über die Sache, hat auch damit zu tun gehabt, die hatten vorher auch ein großes Migrationsprojekt, aber in dem konkreten Fall war der Auslöser eigentlich keinen Mehrwert drin zu sehen."	E12: 38
Impact on Corporate Culture	Cloud Requires a Different Approach Than On-Premise	"Ja, also ich glaube vor allem, dass einfach das Paradigma, die Herangehensweise bei Cloud zu on-premise ganz anders ist. Also bei on-premise hast du halt alles unter Kontrolle, du musst aber auch alles selber machen [...]"	E20: 45
	Culture Has Shifted Towards More Responsibility of Employees to Adapt	"Ich glaube, dass sich das, dass sich eine Kultur schon dahingehend verändert hat, dass mehr Verantwortung zu dem Mitarbeiter übergeht, ein Mitarbeiter selber intrinsisch mehr motiviert sein muss, sich mit den Themen auseinanderzusetzen und deutlich flexibler sein muss."	E1: 51
	Need to Constantly Adapt to Changes	"Ich glaube, die Zeit, dass du heute halt irgendwie stillstehst und alles gleichbleibt, die ist durch, ist halt so. Klar, wir müssen halt extra aufpassen beim Rollout, beim Kommunizieren und Releasewechsel und sonst was, dass wir halt die End-User wieder mitnehmen."	E18: 61
Communication and Change Management	Identify Employee's Wishes in One-On-One Meeting	"Und die sich dadurch ja dann halt auch einfach nur noch steigert. Du kannst dann halt nur versuchen, in einem Einzelgespräch rauszubekommen, welchen Teil würde er denn dann trotzdem noch machen?"	E8: 47
	Accompany Others During the Change	"Das ist dann die Aufgabe von dem Plattformteam. Aber das Enabling Team hat jetzt, so wie wir das einsetzen wollen, speziell die Aufgabe, diesen Change mitzubegleiten."	E19: 44
	Explain the Value of Cloud	"Gute Frage. Ja, also grundsätzlich das Wichtigste ist erstmal zu versuchen, warum man das Ganze macht. Das haben wir jetzt auch bei [Projektname 1] und so weiter auch versucht, dass man einfach mal die Vorteile, die es in der Cloud gibt, den Leuten erklärt."	E11: 34
Skills, Training, and Talent Management	Combining Theory and Practice	"Also ich glaube, was nix bringt und was wir gerade sehen, auch zum Beispiel bei Bewerbern ist, wenn Leute sich irgendwo theoretisch hochtrainiert haben, auch vielleicht zertifiziert haben, aber das nie in der Praxis gesehen haben. Also ich glaube, wichtig ist Theorie und Praxis in einer guten Mischung, sprich sowas wie Playgrounds."	E12: 46
	Employees Need to Learn New Skills	"Teams haben viel mehr Möglichkeiten, haben aber auch viel mehr Eigenverantwortung. Das heißt, sie müssen gewisse neue Skills lernen, sie müssen technische Skills lernen, sie müssen aber auch irgendwie so neue Ansätze finden."	E19: 44
	Company Provides AWS Playground	"Dann haben wir einen Playground-Account, wo die Leute Sachen ausprobieren können."	E4: 79

Appendix D.4 Selective Code #4

Selective Code #4: Process-Related Factors			
Axial Codes	Examples of Open Codes	Associated Text Segment	Source
Impact on Business Processes and End-Users	End Users Need to Change Routines	"Ich kann nur sagen, Änderungen mag er nicht. Das kann ich sagen, weil Änderungen bedeuten, dass seine einzelnen Routinen, wie er Sachen bearbeitet, sich ändern. Das ist was er nicht mag."	E13: 47
	Need to Adapt to Using Standard Instead of Custom Software	"[...] sondern auch bei unseren Kunden, weil die halt teilweise komplett anders arbeiten müssen. Und halt nicht mehr ihre Spezialsoftware haben, die sie schon seit 10 Jahren gewohnt sind und mit denen sie letztendlich auch auf ihre Bedürfnisse angepasst sind, sondern die müssen halt an den Standard aus der Cloud nehmen."	E11: 28
	Employees in Core Business Will Need to Learn to Use New Tools	"[...] es ist wieder etwas Neues, was du lernen musst. Es kann sein, dass sich da die Leute ein bisschen querstellen. Aber das Kerngeschäft wird definitiv im Wandel sein, und es wird einfacher, die Leute müssen halt nur mitmachen. Aber ich denke mal, dass unser Laden da, dass die da offen dem gegenüber sind, ja."	E9: 69
Impact on IT Processes	Developers Are Shifting to DevOps	"Und in den Entwickler-Teams, das hatte ich vorher noch vergessen, ist es halt so, dass wir schon eine stark Richtung DevOps gehen wollen. Das heißt praktisch, wenn ich entwickle, dass ich auch dementsprechend das betreibe, was auch bei der Infrastruktur in dem Sinne oft ja nicht gemacht haben [...]"	E11: 38
	Being Dependent on Customer Support	"Ansonsten hast du halt nur die Produktdokumentation, die manchmal gut ist, manchmal weniger gut, aber bei neuen Themen hat viel zu wenig ist für das, was du manchmal brauchst und dann hast du halt noch den Kundensupport. Und das ist ja auch so ein Problem. Du bist angewiesen auf diesen Support. Du bist angewiesen, dass der Support-Mitarbeiter da nachschaut für dich, da gibt es Sachen, die kannst du einfach nicht einsehen."	E20: 59
	Analyze Processes	"Es ist im ersten Schritt, wenn die Entscheidung getroffen ist, wir gehen in die Cloud, dann werden die Prozesse untersucht. Das heißt, so Business Process Consultants, die sind dann sehr stark gefordert, um die Prozesse nochmal zu überdenken."	E7: 29
Migration Process	Relying on Best Practices From Providers	"Meistens sind es irgendwelche Themen, also meistens hast du Best Practices von irgendwelchen Herstellern, an dem du dich festhalten kannst, und dementsprechend umsetzen kannst."	E9: 91
	Checking if Technically Possible to Migrate	"Ja, wir haben einfach nur geschaut so technisch, ob es möglich ist, das in die Cloud zu packen, also die einzelnen Applikationen. Bei vielen war es dann so, ah ja, die Applikation wird noch von 10 anderen angesprochen."	E15: 86
	High Migration Effort for LOBs Is Often Underestimated	"Und du musst halt auch sehen, also diese ganzen LOBs, die wir onboarden, die bei uns eben Customer Support machen, für die ist es ja ein riesiger Aufwand, umzuziehen. Und man unterschätzt das."	E20: 67

Appendix D.5 Selective Code #5

Selective Code #5: Organizational Implications			
Axial Codes	Examples of Open Codes	Associated Text Segment	Source
Impact on Organizational Units	Cloud-Induced Organizational Changes Take Time	"Das würde ich jetzt als Erfolg bezeichnen, aber die Umsetzung, da haben wir noch einen weiten Weg vor uns. <u>Auch bei diesen organisatorischen Änderungen, das ist ja auch nicht so, dass man ein Unternehmen jetzt in einem halben Jahr umbaut, das ist ja eine lange Reise.</u> "	E2: 29
	Splitting Cloud Competence Center Into Cloud Enablement and Cloud Core Team	"Das Cloud-Kompetenz-Center wird quasi mit rüber in ein neu zu gründendes Team überführt, wo wir praktisch dann so einen gewissen Split machen. Wir haben einerseits praktisch dann so ein Enablement-Team, das dann wirklich der Versorgung fragen kann, dass die Teams in die Lage gesetzt werden, die Cloud zu transformieren, also auch unsere Entwicklerteams."	E11: 42
	Establishing Cloud Enablement Tam	"Das Cloud-Kompetenz-Center wird quasi mit rüber in ein neu zu gründendes Team überführt, wo wir praktisch dann so einen gewissen Split machen. <u>Wir haben einerseits praktisch dann so ein Enablement-Team, das dann wirklich der Versorgung fragen kann, dass die Teams in die Lage gesetzt werden, die Cloud zu transformieren, also auch unsere Entwicklerteams.</u> "	E11: 42
Impact on Roles	Cloud Requires New Roles	"Ob extra Rollen geschaffen werden, das weiß ich nicht, <u>aber es werden neue Rollen benötigt.</u> "	E1: 37
	More Complex Jobs	"Ich würde sagen, <u>wir haben komplexere Jobs</u> und der zweite Punkt ist, wir haben zurzeit einen anderen Markt."	E13: 77
	Physical Datacenter Management Becomes Obsolete	"Ja klar, also alles das, was ich schon gesagt habe. <u>Alles das, was vorher so physisch war. Also Kabel ziehen, Büchsen reinfahren, dann Racks bestücken, Klimaanlagen warten, das ist alles weg. Also alles, was in diesem klassischen Rechenzentrumsbetrieb und die Schicht oben drüber, mehr oder weniger das Monitoring auf die Kisten macht und das mal irgendwie Festplatten tauscht und so Zeug.</u> "	E5: 79
Role of External Partners	Engaging External Partner for Implementation	"Das war so der Grundstock der [Firmenname]-Mitarbeiter. <u>Und dann haben wir entschieden, das eigentlich komplett an eine Drittfirm zu vergeben, dieses implementieren und bauen.</u> Und da haben wir uns im Prinzip die Fachkräfte und das Wissen eingekauft, wenn du so willst."	E18: 53
	More External Partners in the Beginning	" Einfach aus dem Grund, da ist halt dedizierteres, tieferes Fachwissen bezüglich ServiceNow vorhanden. <u>Das waren am Anfang natürlich sehr viel mehr. Bis halt auch das eigene Personal in ServiceNow soweit fit war, als dass man sagt, okay, jetzt können wir mal ein bisschen runtergehen und die Anzahl der externen Service Provider da runter drehen.</u> "	E8: 39
	Giving Tedious Tasks to External Partners	"Das machen wir schon sehr lange mit einem Partner. <u>Und da geben wir auch manchmal Fleißarbeiten raus, wenn wir Budget haben.</u> Die helfen uns auch prozessual ein bisschen."	E4: 63

Appendix D.6 Selective Code #6

Selective Code #6: Technical Implications			
Axial Codes	Examples of Open Codes	Associated Text Segment	Source
IT Infrastructure and Architecture	Own Data Centers Are Almost Completely Moved to the Cloud	"Ja, wobei wir sind gerade dabei unser Rechenzentrum die letzten Schritte abzuschalten, das alles wirklich in die Public Cloud zu bringen."	E2: 59
	Less Virtual Machines, More Containerization	"Also grundsätzlich von dem, was ich so am Rand miterlebe, ist es, würde ich sagen, mehr Containerisierung. Alles, was früher VM war, ist jetzt Container."	E15: 116
	Company's On-Premise Technologies Are State of the Art	"Es kommt noch ein weiterer Faktor dazu: meine Vorfahren haben entschieden, dass der New Campus gebaut wird mit dem größten und modernsten Rechenzentrum, das ich je gesehen habe. Und wir wären ja bescheuert, wenn wir das nicht nutzen würden."	E4: 39
Technical Challenges of Cloud Integration	No Customization Possible in the Cloud	"Aber das Umbauen funktioniert in der Cloud nicht mehr. Und damit ist man genau dann in dieser Problemstellung. Das muss man halt verstehen."	E13: 63
	No Control Over Patches, Getting Them When Everybody Else Gets Them	"Das ist natürlich im Falle Service Now jetzt für uns auch wieder ein Learning. Wir kriegen es dann, wenn es auch alle anderen Kunden kriegen. Also wenn da irgendwie eine Sicherheitslücke drin ist, müssen wir fixen, aber halt dann, wenn sie auch alle anderen fixen."	E8: 60
	Being a Frontrunner Pushes ServiceNow to Its Boundaries	"Ja, in der Theorie. Das Problem ist aber, dass wir an ganz vielen Systemen halt Frontrunner sind. Wir bringen das System an ganz vielen Ecken und Enden an die Grenzen und das sind dann oft Sachen, die die Entwicklung noch nicht bedacht hat."	E20: 61

Appendix E Overview of Success Factors, Challenges and Best Practices Identified in the Multiple Case Study

Appendix E.1 MediaCorp

MediaCorp		
Success Factor	Challenges	Best Practices
Cloud Governance and Coordination	<ul style="list-style-type: none"> Lack of Awareness and Networking Among Cloud Experts Lack of Communication in Migration Projects 	<ul style="list-style-type: none"> Not Using Cloud Dogmatically; Infrastructure Strategy Over Cloud Strategy Defining Cloud Operating Model and Cloud Governance Framework Conducting Cloud Assessment Project Fostering Awareness and Networking Among Cloud Experts
Value Communication and Exploration	<ul style="list-style-type: none"> History of Failed Cloud Initiatives Led to Internal Conflicts Resistance Towards Migration When Added Value Is Not Understood or Purely Financially Motivated 	<ul style="list-style-type: none"> Communicating and Practically Demonstrating Added Value of the Cloud Letting Employees Explore Added Value (e.g., in Workshops) Explaining Added Value in Enterprise Context When There Is No Direct Impact on Individuals
Establishment of Organizational Cloud Units	<ul style="list-style-type: none"> Coordination of Different Cloud Units Overlapping Responsibilities of Different Cloud Units 	<ul style="list-style-type: none"> Establishing Cloud Competence Center to Govern Cloud Activities in the Company Establishing Cloud Core Team as an Operational Unit Establishing Cloud Enablement Team to Enable Others for Cloud Migrations
Cloud Skills Among the Workforce	<ul style="list-style-type: none"> Cloud Requires New Technical Skills (e.g., Infrastructure as Code) Cloud Increases Developers' Responsibilities Cloud Requires Communicational and Mentoring Skills for Cloud Enablement Team Members Often Hard to Find Cloud Experts on the Job Market 	<ul style="list-style-type: none"> Focusing on One Cloud Provider to Reduce Complexity Forming Cloud Enablement Team to Upskill Others Offering Many Training Options (e.g., Udemy and Certifications) Allowing IT Staff to Allocate 20% of Work Time for Training and Further Education Combining Theoretical and Practical Training (e.g., by Providing Playgrounds) Learning From External Service Providers in Team Augmentation
Awareness of Changed Financial Paradigm	<ul style="list-style-type: none"> Cloud-Induced Shift From CapEx to OpEx is Challenging, Especially as a Publicly Traded Company Company Faces High Cost Pressure Simplistic TCO Assessment Neglects Benefits of the Cloud Hard to Compare Different Types of Costs, Especially Due to Opportunity Costs 	<ul style="list-style-type: none"> Communicating and Explaining Shift From CapEx to OpEx to the Board, Internal Financial Units, and the Stock Market Considering Indirect Financial Benefits of the Cloud (e.g., Operational Efficiency)

Appendix E.2 InsuCorp

InsuCorp		
Success Factors	Challenges	Best Practices
Harmonization of IT System Landscape	<ul style="list-style-type: none"> Making Many Exceptions From Global Blueprints Special Requests From International Colleagues Cloud Adoption Does Not Automatically Mean Application Harmonization 	<ul style="list-style-type: none"> Being Consistent and Sticking to Blueprints Including Practitioners in Architectural Boards Focusing on Certain Technologies Within the Cloud Offering
Migration of Systems With Industry-Specific Requirements	<ul style="list-style-type: none"> Cloud Providers Often Do Not Design Systems Compliant With Regulation Need to Adapt Systems According to Regulation Longevity of Products Increases Complexity of Migration Need to Keep Systems Alive That Do Not Make Money Legacy Systems Based on Legacy Programming Languages That Do Not Work in the Cloud 	<ul style="list-style-type: none"> Migrating Business Aspects Rather Than Legacy Systems Abstaining From Features Sticking to Standards
Business Case Orientation	<ul style="list-style-type: none"> In Some Use Cases, Cloud Is Less Performant and More Costly Extensive Customization Is Costly in the Long Run End-to-End Understanding of Technology and Business Is Complex 	<ul style="list-style-type: none"> Not Using Cloud Dogmatically; Assessing Every Use Case Individually Calculating Business Case Thoroughly Beforehand Sticking Close to Standards to Minimize Long-Term Costs Letting IT Professionals Learn Business and/or Vice Versa
Cloud Skills Among the Workforce	<ul style="list-style-type: none"> Shortage of Skilled Cloud Experts Cloud Requires Experts With End-to-End Understanding, Which Are Rare Global Competition for Professionals; Hard to Compete With Salaries as an Insurance 	<ul style="list-style-type: none"> Learning Interconnected Thinking by Working in Various Departments Supporting Every Kind of Training Being More Flexible in Job Offerings
Approach Towards Cloud Migration Projects	<ul style="list-style-type: none"> Approaching Migrations Top-Down Is Inefficient <ul style="list-style-type: none"> Underestimating Migration Effort Board Does Not Embrace Agility 	<ul style="list-style-type: none"> Starting Projects Small and Building MVPs Identifying Road Blockers Fast Working Agile at the Implementation Level, While Reporting in Waterfall Manner Managing Cloud Projects Like Any Other IT-Projects (e.g., with Jira)

Appendix E.3 SoftwareCorp

SoftwareCorp		
Success Factors	Challenges	Best Practices
Relationship and Communication With ServiceNow	<ul style="list-style-type: none"> • Less Control, Insight, and Monitoring in the Cloud • Being Dependent on ServiceNow's Support Agents • Being a Frontrunner Pushes ServiceNow Platform to Its Limit <ul style="list-style-type: none"> • Different Terminology Than ServiceNow • ServiceNow Is Both Customer and Competitor 	<ul style="list-style-type: none"> • Following up on ServiceNow's Support Constantly • Establishing a Relationship of Mutual Benefit With ServiceNow • Developing Workarounds Instead of Waiting for Formal Solution by ServiceNow • Letting ServiceNow Incorporate Custom Solutions
Attitude Towards ServiceNow as an External Solution	<ul style="list-style-type: none"> • "Not Invented Here" Attitude Towards ServiceNow • General Skepticism of Older Employees Against Cloud • Politically Motivated Resistance When ServiceNow Overlaps With In-House Tools • Occasional Performance Issues for Individual Users 	<ul style="list-style-type: none"> • Employing Change Management and Communicating Extensively • Adapting UIs to User Groups to Avoid Information Overload • Giving Employees Time to Adapt and Address Their Fears <ul style="list-style-type: none"> • Communicating the Value of the Migration • Not Forcing Employees; Allowing to Switch Job Internally; Letting Resistant Employees Manage Old System That Runs in Parallel
Skills and Knowledge of ServiceNow Among the Workforce	<ul style="list-style-type: none"> • Initially Little Internal Knowledge About ServiceNow <ul style="list-style-type: none"> • Hard to Recruit ServiceNow Experts • No Resources to Train Young Professionals 	<ul style="list-style-type: none"> • Hiring External Service Provider for Development <ul style="list-style-type: none"> • Keeping Key Roles in the Company • Learning From External Service Providers • Leveraging a Wide Range of Training Possibilities
Establishment of a ServiceNow Center of Excellence	<ul style="list-style-type: none"> • Accompany Lines of Business in Onboarding <ul style="list-style-type: none"> • Complexity of Integration Landscape • Many Demands But Only Few Resources 	<ul style="list-style-type: none"> • Change Management Unit to Onboard Lines of Business • Program Management Unit to Prioritize Demands
Process Harmonization	<ul style="list-style-type: none"> • Many Divergent Processes, Especially Due to Acquisitions • Every Unit Is Accustomed to Their Own Process and Unwilling to Change 	<ul style="list-style-type: none"> • Rethinking, Simplifying and Harmonizing Existing Processes <ul style="list-style-type: none"> • Cutting off Outdated Practices • Mandate From Top Management • Employing Internal and External Process Consultants