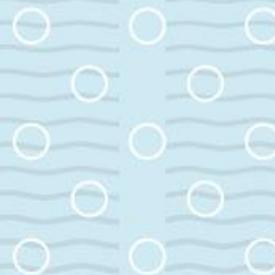


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# Organization's transition to a cloudy journey

*What are critical success factors and significant benefits of using cloud computing solutions?*



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This thesis is worth 30 study points

# Abstract

The cloud computing paradigm has existed for a long time but has gained momentum in the last decade. The emergence of Covid-19 accelerated this trend enabling cloud technology to demonstrate its disruptive capabilities. Thus, more organizations are aware of the need to go cloud. However, what it means is a different story. A transition to the cloud has various complexity levels and necessitates proper understanding to reap full benefits. The goal of this study was to grasp the cloud computing phenomenon in a strategic management context through the following research questions:

*What are critical success factors when organizations are transitioning to the cloud?*

*What are significant benefits when organizations are transitioning to the cloud?*

This qualitative study relied on the foundation of a systematic literature review and in-depth interviews to build a case around essential preconditions when organizations opt for cloud solutions. This research took place from January 2021- June 2021.

Nine participants from the technology industry operating across countries devoted their knowledge by providing rich deep data concerning organizations transitioning to cloud computing solutions. The theoretical perspectives of Resource-based theory, Knowledge management, Transaction Cost Theory, and Self-Determination Theory provided a foundation for further data collection.

Four significant critical success factors emerged from the interviews:

Readiness was necessary to align the proper cloud strategies with organizational needs and culture.

Competence was inherent due to the vast complexity of the cloud paradigm and the dynamic environments organizations operate.

Transaction Costs were essential to raise awareness around unanticipated costs of going cloud and the importance of engaging in relational governance.

Technology was a means to an end, but a complex one demanding extensive expertise in given contexts.

Together, cloud computing solutions in light of these factors would generate benefits such as increased agility and computation power, technological capabilities enabling organizations to adapt to an ever-changing digital environment faster and gain strategic advantages. Economic gains would ensue from that but demanded a proper alignment between these critical success factors enabling strategy, governance, and optimization processes to create synergies along strategic, organizational, technological, and economic dimensions.

This study helped demonstrate the inherent need for proper knowledge in various aspects of cloud solutions and building strategic relationships to operate advantageously in today's business ecosystems. Moreover, it exposed the lack of cloud-specific expertise pertaining to a critical need for academics and businesses to cooperate to ensure a happy cloud journey for organizations in the future.

Despite the limited generalization value of this thesis, it has excellent informative value for business decision-making related to cloud computing solutions and academics seeking research inspiration.

# Preface

This Master's thesis was the last step in accomplishing my Master's in Business and Administration at the University of South-Eastern Norway.

First and foremost, I would like to express my sincere appreciation to all that have supported me during my research, especially amid the Covid-19 pandemic, which induced excessive psychological pressure. I must admit that there were times where I thought I would not be able to accomplish my research.

I would also like to thank the University of South-Eastern Norway for providing the tools and support both academically, logistically, and morally during these past two years. Special gratitude to my supervisor Øystein Sørebo for being patient with my struggles, providing helpful guidance, constructive criticism, and moral support along this rollercoaster of a journey.

I express thankfulness to all my friends for supporting and rooting for me during these challenging times. A special thanks to Bobby, who has been there for me my whole life, motivated me through this task, discussed relevant subjects and less relevant ones.

A special acknowledgment goes to all informants who took their time to help and provided an extensive amount of insight on the matter. I am grateful for their valuable, enlightening, and fun to acquire knowledge.

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Two quotes stuck with me during this voyage:

*"Everybody has a plan until they get punched in the face" -Mike Tyson-*

*"If we knew what it was we were doing, it would not be called research, would it?" -Albert Einstein-*

Oslo/30.05.2021

Joëd Marthinsen

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# 1. Introduction

Globalization and technology have modified business models and reconfigured processes, policies, working locations, and customer characteristics (Hechanova, Caringal-Go, Magsaysay, 2018).

Digital transformation has spawned impetus for organizations to transition to the cloud to optimize customer expectations and deliver value propositions. With the rise of digital content in more consumer-oriented industries, organizational processes are becoming increasingly digitized.

This need is solved well by cloud computing technology capabilities when exploited appropriately (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018).

The cloud computing paradigm has reconfigured the construct of computer science by emerging as the backbone of the modern economy through a subscription-based service. However, the explosion of cloud solutions has engendered challenges forcing organizations to address relevant issues to develop future cloud computing environments (Buyya, Srirama, Casale, Calheiros, Simmhan, Varghese, ... & Shen, 2018).

Thus, organizations seeking to transition to the cloud need to reallocate task responsibilities, procure on-demand self-service, govern the relationship with the cloud provider, and design proper contracts for standardized services to unlock all the advantages of cloud solutions (Wang, Liang, Ge, Xue, Ma, 2019).

In addition, Covid-19 has disrupted the global economic structure, forcing all organizations to adapt to survive (Mahmood, Mubarik, 2020). According to Gartner, by 2021, more than 50 percent of organizations globally will have adopted an all-cloud strategy. However, responsibilities concerning configuration, implementation and intra-organizational training increasingly shift to customers, thus being a potential source of friction that might incite the customer to return to initial systems (Xiao, Sarker, Wright, Sarker, Mariadoss, 2020).

Adapting to change is a challenging endeavor. According to an industry analysis effectuated by McKinsey (2018), more than 70 percent of digital transformation initiatives fail (McCarthy, Sammon, Alhassan, 2021).

Cloud computing needs to align with organizational activities across all layers of the organization to produce benefits (Shao, Yang, 2021).

Transitioning into a new information system may look attractive on marketing slides, with a much bitter taste in reality. The complexity of implementation and usage has social, behavioral, and technical implications. The interplay between people, processes, and technology for organizations transitioning to the cloud is an area well-deserving of more profound research and understanding.

## **1.1. Research objectives**

The decision to outsource to the cloud is a complex endeavor affected by various factors that may lack updated empirical evidence in extant literature. Hirschheim and Lacity affirmed the need for evidence-based research on the cloud sourcing paradigms future impact (Johansson, Muhic, 2017). Thus, implying a need for more research in Cloud computing (CC) regarding both perspective of the provider and the user. It is helpful to understand the factors acting as a deterrent for CC adoption to benefit strategic decision-making (Sharma, Gupta, Acharya, 2020).

The thesis explores critical success factors for organizations transitioning to the cloud and the benefits of using those solutions. The research will delineate criteria organizations need to assess when considering transitioning from traditional organizational structures to a cloud-based organization and the benefits of utilizing cloud-based technology. Exploiting this knowledge may raise awareness around improving relationships between vendors and customers, thus mitigating customer failure, which is beneficial for cloud users and cloud providers.

Conducting a literature review and collecting data from technology organizations with expert power will illuminate the status of the paradigm in today's business context and conceivably facilitate better decision-making regarding this phenomenon.

## **1.2. Research questions**

The focus is on critical success factors for organizations transitioning to the cloud and the benefits of using cloud solutions. Two different but related research questions are raised:

*What are critical success factors when organizations are transitioning to the cloud?*

*What are significant benefits when organizations are transitioning to the cloud?*

Open questions suggest an open approach to integrating various theoretical perspectives to gain a holistic understanding, which I will discuss more thoroughly in chapter two.

## **1.3. Structure**

Five chapters frame this thesis.

The first chapter introduces the phenomenon of interest, announces the cloud computing phenomenon, delineates the research framework by depicting research objectives followed by research questions to direct the focus of the study.

The second chapter constitutes the theoretical framework. It explicates the construct of cloud computing outsourcing, critical success factors, and benefits relevant to the study. Furthermore, it encompasses a literature review effectuated on outsourcing cloud computing solutions, critical success factors, and benefits of cloud technology.

The third chapter constitutes the method chapter.

The fourth chapter presents the data analysis collected in the study.

The fifth chapter discusses the findings, followed by a conclusion, limitations, implications, and suggestions for future research.

## **2. Theoretical framework**

This chapter serves as the theoretical foundation, giving direction to the study methodology and a frame of reference during the interpretation of the findings. The first subchapter seeks to clarify the constructs relevant to the study: Cloud computing, outsourcing, critical success factors, and benefits. The second dives into the theoretical perspectives of Resource-Based View, Knowledge Management, Transaction Cost Theory, and Self-Determination Theory, serving as an anchor for the subsequent progression of the thesis. The purpose of this is to get the whole picture of people, processes, and technology and their underlying mechanisms. In the cloud context, one cannot solely rely on capabilities, internal expertise, external consultants, or technology separately to exploit cloud capabilities to the fullest and reap their benefits. It requires a holistic approach to resource orchestration, capability development, organizational learning, and employee motivation to use cloud technology strategically. Especially in light of its vast complexity and dynamic growth, organizations need to know how the cloud is necessary for a successful transition. By combining these theoretical approaches, organizations may realize how these forces interplay to create synergies, thus reap the full benefits of cloud computing solutions. The last subchapter exposes challenges related to cloud technology uncovered from the literature review.

### **2.1. Construct elaboration**

This chapter seeks to clarify the constructs figuring in the research questions and justify the rationale regarding the focus of the study. The constructs of cloud computing, outsourcing, critical success factors, and benefits will be defined, respectively, focusing on the focal construct of cloud computing.

#### **2.1.1. Cloud computing**

This subchapter dives into the concept of cloud computing and its features, visualize an overview of the cloud industry and clarifies the role of Cloud Service Providers.

##### *2.1.1.1. Definition*

The focal construct of this thesis is cloud computing. The literature contains a vast amount of research on the paradigm. The technology has developed considerably since its appearance, thus the importance and usefulness of diving into further studies. Researchers have employed various definitions of this construct. The following definitions delineate the contouring of the adopted cloud computing perspective for this study.

Mell and Grance (2011) and the National Institute of Standards and Technology (NIST, 2014) define cloud computing as "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources such as network, servers, storage, applications, and services that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Birje, Challagidad, Goudar, Tapale, 2017; Bouaynaya, 2020).

Cloud computing classifies as an information system consisting of substantially scalable computing resources such as infrastructure, platforms, and services, enabling real-time data sharing capability throughout the supply chain (Schniederjans, Curado, Khalajhedayati, 2020).

These definitions help outline the construct of CC as an elastic and responsive virtualized distributed resource pool providing on-demand services through a pay-per-use pricing model.

The thesis will explore this perspective of the cloud computing construct. The paradigm is vast, but the focus of this thesis center around the use of technology for business purposes and gains.

#### *2.1.1.2. Virtualization*

Virtualization is fundamental to understanding the concepts of the cloud. Virtual Machines (VM) are specific software enabling physical computers to run operating systems and applications on their operating system (OS). The technology creates virtual networks, servers, and devices, creating a pool of abundant resources providing customers with constant availability, dynamic resources scaling for a reasonable investment. Consistent resource requirements and availability require dynamic adjustment of the state of the system to secure optimal performance (Belgacem, Beghdad-Bey, Nacer, Bouznad, 2020).

Moreover, VM is cost-saving as it enables consumers to unplug resources when not operational, thus only paying for consumption. For example, in Microsoft Cloud, VM's stand on the Microsoft Azure data center's physical servers. Still, system failure may occur as with all physical devices, and the Azure platform will work to locate a secure server for regeneration. VM's may also experience punctuated interferences instigated by the Azure Platform as Microsoft periodically improves the operating system, rendering it momentary inaccessible. Overall management of VM's is mainly the user's responsibility and the resources consumed at their discretion. However, Azure requires at least two VMs to be accessible as a prerequisite for offering a Service Level Agreement. It ensures several connection points thwarting the possibility for failures and minimizing impact during Azure platform operating system updates (Qarkaxhija, 2020).

Constraints on cloud providers and users engender challenges in delivering dynamic cloud services. Downtime for cloud services is a significant challenge for Cloud Service providers. Hence, fault tolerance is considered a critical obstacle related to reliability, robustness, and availability of services in addition to application execution in cloud computing systems (Belgacem, Beghdad-Bey, Nacer, Bouznad, 2020). Nonetheless, CC has increasingly gained popularity with its supreme functions and various models delivering services to end-users (Sharma, Gupta, Acharya, 2020). Cloud working models are separated into deployment models and service models (Gundu, Panem, Thimmapuram, 2020).

### 2.1.1.3. *Deployment model*

Cloud Service Providers (CSP) may offer CC services via their own data centers in the public cloud, user data centers in the private cloud, or installed on their own and user data centers in the hybrid cloud (Sharma, Gupta, Acharya, 2020). Organizations use the private cloud for internal objectives and the public cloud according to external interference. The various deployment models are similar apart from the scope and accessibility features delivered to cloud consumers for each model.

The public cloud is an external cloud openly accessible to all users. It is off-premises in which third-party enterprises may deliver services to users. Google App Engine, IBM Blue Cloud, Amazon Elastic Compute Cloud (CE2), and Windows Azure Service are such models (Birje, Challagidad, Goudar, Tapale, 2017).

On the other tip of the scale lies the private cloud such as Seagate, an internal on-premises cloud customized to organizations to provide a high level of control over cloud services and infrastructure, allowing for organizational maintenance of security and privacy (Birje, Challagidad, Goudar, Tapale, 2017).

Private cloud embodies the concept of asset specificity between supplier and buyer by offering massive scalability capabilities accessible by a selected organization, empowered to delegate access to users with a secure connection, and security measures. CC may serve as a communication mechanism between partners, and a private cloud may diffuse personal process knowledge to a selected partner. Thus, responsive and securely accumulated knowledge in the private cloud increases asset specificity in a buyer-supplier relationship (Schniederjans, Hales, 2016).

Then, there is a hybrid cloud such as US Microsoft Hybrid Cloud and IBM Cloud App Development, a virtual private cloud ecosystem combining private and public clouds. It is hosted and managed off-premises by a third party, with specific resources dedicated to the organization for personal usage (Birje, Challagidad, Goudar, Tapale, 2017). Hybrid clouds incorporate cheap and scalable features of the public cloud and the high security of the private cloud. Cloud service interoperability enables seamless interaction between applications and components deployed in the hybrid cloud service model (Bouzerzour, Ghazouani, Slimai, 2020).

Lastly, the community cloud, such as sourcingfocus.com, consists of a cloud environment shared or managed by a group of related organizations (Birje, Challagidad, Goudar, Tapale, 2017).

In the community cloud, services are provided and consumed by different organizations with similar business models as the provider (Sharma, Gupta, Acharya, 2020).

Service models are elaborated on next.

#### 2.1.1.4. *Service model*

Cloud computing delivers exceptionally scalable Information Technology (IT)-related facilities as a service through the Internet to customers. Different cloud service models named XaaS are offered according to customer requirements. Hardware, software, platform, infrastructure, data, and business are provided as a service (Birje, Challagidad, Goudar, Tapale, 2017). The most important are defined as follows:

Software as a Service (SaaS) facilitates network applications accessible by traditional browsers. They supply an environment where projects may be developed for personal and business purposes and charged through a monthly or annual subscription-based payment model. The cloud service provider bestows installation costs and maintenance costs such as software updating. In addition, prepaid users always have access to the latest version. SaaS such as Gmail, Google Drive, Salesforce, IBM LotusLive, Office 365, Dropbox, WordPress, and Amazon Kindle are offered to end-users ready to be consumed on-demand as the software is produced and maintained by a third party (Birje, Challagidad, Goudar, Tapale, 2017; Gundu, Panem, Thimmapuram, 2020; Qarkaxhija, 2020).

Platform as a Service (PaaS) comprises Software and development tools hosted in CSP's servers, acting as a background that provides runtime environments, software development framework, and components to facilitate direct deployment of application-level assets or web applications. Developers may operate the entire life cycle of software on the platform with these tools. PaaS like Google App Engine, Amazon Web Services (AWS), and Microsoft Azure enable end-users to leverage software for creation purposes (Birje, Challagidad, Goudar, Tapale, 2017; Gundu, Panem, Thimmapuram, 2020). The model provides services such as databases, operating systems, and web servers to exploit and operate cloud software without investing in specialized hardware and software adaptation activities. Thus, enabling the creation of easily accessible network applications without the complexity of software purchase and maintenance (Qarkaxhija, 2020).

Infrastructure as a Service (IaaS) such as Amazon Web Services (AWS), Cisco Metapod, Microsoft Azure, Google Compute Engine (GCE) provides an abstract cloud computing service from which all services run, through a physical technology. It includes processors, data storage, programming language, operating systems, and network access according to customer demand (Qarkaxhija, 2020; Gundu, Panem, Thimmapuram, 2020). The devices are configured and connected to a cloud environment to generate a VM. Customers are responsible for maintaining and controlling the systems and data storage but not the fundamental cloud infrastructure (Qarkaxhija, 2020). IaaS is the fundament of all cloud models. Interoperability in this model creates value from combining computing, storage, and computational resources. Thus, increasing scalability and improving the service quality. Moreover, this makes it easier for managers to monitor applications operating across infrastructures (Bouzerzour, Ghazouani, Slimai, 2020).

### 2.1.1.5. *Cloud Service Providers*

Cloud computing has given rise to many CSPs because enterprises adopt the technology. Providers aim to configure cloud service platforms to maximize profit, affecting service quality, impacting customer satisfaction, service-level agreement (SLA), prices, and energy consumption (Mei, Li, Li, 2017). CSPs exploit cloud resources such as infrastructure, platforms, and services and customize them for end-users according to the privacy, type of instance, and interface. They also delineate the SLA terms that cloud users must embrace. Dynamic resource sharing generated by a cloud service broker agent bridges the gap between cloud resource sharing and cloud service providers by assessing the right datacenters according to user requirements. They assert their crucial role by building, operating, and managing cloud infrastructure, enabling consumers to hire resources and capabilities via abstraction of computing software or collecting network-accessible computing resources detained by the providers. The latter manage workload demand, allocate resources, improve performance, and mitigate system failures by delivering workloads across servers in a cloud environment with high responsiveness, also denoted load balancing (Jyoti, Shrimali, Mishra, 2019).

These benefits demonstrate cloud computing success, and today's cloud industry market includes Salesforce, Amazon EC2, Microsoft Azure, among others (Mei, Li, Li, 2017). Incumbents such as Amazon, Google, and Microsoft made their first cloud solutions appearance around 2002 to 2010 (Bouzerzour, Ghazouani, Slimai, 2020). According to Boillat and Legner (2013), Salesforce Sales Cloud disrupted the CRM software market by transitioning to the cloud in 1999. With capabilities such as account, contact, opportunity, partner management, sales prognoses, fundamental standardized best practices satisfy most client requirements. Salesforce functions with its own data centers and third-party infrastructure providers and provides certification for partners who support cloud clients' implementation, customization, and training (Nieuwenhuis, Ehrenhard, Prause, 2018).

Furthermore, despite growing respective shares of IBM Blue Cloud, Microsoft Azure, and Google App Engine, Amazon Web Services (AWS) still occupies the position as a pioneer (Birje, Challagidad, Goudar, Tapale, 2017). AWS possesses six times more potential in computing capacity. More than all the other cloud providers bundled together pertaining to their influential role as the global cloud services leader. The second best is Microsoft Azure, followed by Google Cloud Platform. However, the latter is the cheapest CSP relative to its competitors (Gundu, Panem, Thimmapuram, 2020).

In the ERP and database market, SAP originated in 1972 by Hopp, Wellenreuther, Hector, Plattner, and Tschira. It is a system designed to safeguard every aspect of organizational functions. In 2012, SAP software system had a 25 percent market share, followed by Oracle with 13 percent and Microsoft dynamics with 5 percent. SAP has hundreds of clients across the world. In general, SAP is more expensive than competitors, making it a hindrance for small and medium enterprises (Elbahri, Al-Sanjary. Ali, Naif, Ibrahim, Mohammed, 2019).

Microsoft Dynamics derives from Microsoft infrastructure that mesh Windows applications enabling easy allocation and sharing of data. According to Panorama Consulting Solutions, a division of The Prescott Group, it is one of the fastest systems around and a strategic fit for global industries. However, this does not imply the design is flawless (Elbahri, Al-Sanjary, Ali, Naif, Ibrahim, Mohammed, 2019). Nonetheless, Microsoft is user-friendly and provides customer training and competence acquisition through certifications for candidates qualifying by international standards. Microsoft launched the public cloud platform, Azure in 2010 as an online portal able to provision cloud services and resources to the end-user by storing and transforming data (Gundu, Panem, Thimmapuram, 2020). Azure integrates with ease into an extant IT environment via broadband, secure private connections, database, warehouse choices, and encryption characteristics. Their cloud solution facilitates increased IT alternatives, less complex, and more cost-effective solutions, rendering it one of the best cloud services available on the market (Qarkaxhija, 2020). Cloud service providers such as Google, Microsoft, Yahoo, IBM, and Amazon have adopted cloud technology spurring an escalation of usage of cloud services. Cloud Computing has evolved dramatically, but still, challenging issues such as interoperability, resource scheduling, virtualization, and especially security occur with significant ramifications (Birje, Challagidad, Goudar, Tapale, 2017). Thus, organizations should understand the underlying mechanisms of employing such services, as this knowledge seems critical.

### 2.1.2. Outsourcing

This subchapter focuses on the decision to outsource and its relevance to cloud sourcing.

Outsourcing is defined as external contracting of selected non-essential functions related to producing goods or services via informal or formal agreements with organizations specializing in those non-essential functions (Prajapati, Kant, Tripathi, 2020). Software outsourcing is related to transforming development activities, process management, and management decisions to distributed sites spanning borders (Akbar, Khan, Mahmood, Alsanad, Gumai (2020).

This view is deemed relevant for cloud computing outsourcing and studying the challenges organizations may encounter when choosing a partner and solution.

Furthermore, literature related to outsourcing with a specific focus on performance outcomes revealed capacity increase, agility, improved financial performance, optimized resource utilization, and increased market share as critical success factors. In addition, core competency, increased flexibility, governmental encouragement, expertise in-house, cost reduction, access to new technology, quality improvement, new product development, and service time reduction were crucial for successful outsourcing. Finally, strategic factors occurred as the most critical, followed by organizational, financial, operational, and human-based aspects (Sharma, Gupta, Acharya, 2020; Prajapati, Kant, Tripathi, 2020).

### 2.1.3. Critical success factor

This subchapter defines critical success factors (CSF). It delineates a brief overview of extant CSF literature for organizations considering adopting cloud computing solutions.

The notion of success factors emerged with Daniel (1961) and Rockhart (1979) and developed into Critical Success Factors (CSF). A method to withdraw essential information from an extensive set of data generated by a management information system. According to Rockhart (1979), CSF's constitute the focal elements to success for an organization to prosper. These factors serve as a guide for beneficial decision-making. In information systems, this may include top management support, education, training, change management, involving end-users, and the use of consultants (Jæger, Bruckenberg, Mishra, 2020).

Research argues that user satisfaction, information, system quality, managerial information technology (IT) features, and technical capability impact a successful cloud journey and organizational performance. Thus understanding critical success factors of cloud computing usage is highly valuable to management and the organization. Also, management has a crucial role in instigating processes to orchestrate resources accordingly to enhance the influence of the constructs mentioned above (Khayer, Bao, Nguyen, 2020).

Studies of critical factors of organizations cloud computing acceptance mentioned these constructs: management support, security, external pressure, knowledge sharing, collaboration, trust, awareness, vendor support, business continuity, cost, regulations, innovativeness, external expertise, time to market, IT service cost, financial losses, quality of service, competitive pressure, transaction cost (Amron, Ibrahim, Abu Bakar, Chuprat, 2019; Sharma, Gupta, Acharya, 2020).

Literature views the construct of readiness for cloud technology through various lenses.

From a technological perspective, organizations need to assess compatibility and expected service quality to determine performance. Management, innovation capabilities, absorptive capacity, and vendor management capacity will delineate strategic orientation and aptitude from an organizational view. From an economic point of view, evaluation of the cloud service, cloud market impact, and the vendor's understanding will delineate a financial framework analysis to work around. Finally, externalities such as uncertainty and regulations illustrate and impact the environmental structure and boundaries. Assessing all these factors will determine an organization's readiness to transition to a cloud-based organization holistically (Kauffman, Ma, Yu 2018). Moreover, organizational readiness relates to technological, managerial, and financial assets employed to support IT assimilation, such as IT sophistication, corporate capital, absorptive capacity, knowledge management capability, and economic resources (Wang, Liang, Ge, Xue, Ma, 2019).

Readiness related to technology also depicted a combination of perceived behavioral control, facilitating conditions, and compatibility (Amron, Ibrahim, Abu Bakar, Chuprat, 2019).

Based on these arguments, the usefulness of incorporating various theoretical aspects seems reasonable.

Assessing critical success factors is beneficial for CSP and cloud service users (CSU) from a strategic perspective. CSP and CSU may better evaluate and select a compatible relationship partner according to requirements. CC enables workload reduction related to hardware and software deployment, cost reduction, time-effective solutions. Thus, the organization may devote their resource to core competencies and automate traditional IT functionalities and business processes. CSP might also improve service level agreements (SLA), and the CSU may trade-off benefits versus barriers and design their business policy accordingly (Sharma, Gupta, Acharya, 2020).

The ability to relate to critical success factors may alleviate these concerns for organizations and managers aiming to transition to the cloud.

#### 2.1.4. Benefits

This subchapter clarifies benefits induced by the usage of cloud computing solutions.

The cloud computing paradigm has grown extensively in past years globally, optimizing IT strategies in terms of cost reduction and effective resource orchestration. Increasingly more organizations embrace the implementation of cloud computing for the realization of gains. The foundational strength of cloud computing lies in virtualization technology and its capability to enable application and website downloading from the cloud. Through internet connectivity, organizations may migrate all their current applications to the scalable cloud and maximize the usefulness of the technology. It is reasonable to assume the idiosyncratic features of cloud computing engender benefits for organizations engaging with these solutions, assuming they do it appropriately. This research's focal objective is to assess critical success factors, but the benefits are important to underline as they arise as synergetic effects.

The extant theory has described various benefits of the cloud. Ubiquity invoked the ability to access cloud resources regardless of geographical or time constraints, nor any hardware other than computer and Internet connection. Resource sharing pertains to the cloud resources distributed across users, forming a shared resource pool. Elasticity entails scaling up or down resources according to user needs by configuring CPU, bandwidth, storage, and software modules. Scalability invokes the fast deployment rate of applications software and hardware to users. The pay-per-use pricing model enables customers to pay for actual resource consumption and space used in the cloud. However, properly utilizing cloud technology is essential to reap these benefits (Liu, Chan, Yang, Niu, 2018).

Cloud Computing positively correlates with optimizing relational capabilities and increasing economic and environmental performance, which could explicate widespread movement in organizations to move from on-premises to cloud solutions (Schniederjans, Hales, 2016). Cloud sourcing instigates a crucial shift in the evolution of IT service delivery through cost reduction and agility that yield higher strategic benefits than traditional outsourcing (Johansson, Muhic, 2017).

The technology enables sense-and-respond strategies such as dynamic resource commitment, modular process design, active learning, network design, and scope redefinition to effectuate organizational transformation. Such strategic changes influence organizational performance by improving quality, innovativeness, cost, and time savings (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018). Moreover, outsourcing enables an organization to identify a potential partner for growing operations worldwide and gain market share (Prajapati, Kant, Tripathi, 2020). A successful cloud journey encompasses the strategic, economic, and technological benefits of successfully integrating cloud solutions into the organization, including focusing on core competencies, massive access to computation power, human resources, and reduction in IT obsolescence risk. The faster the proper integration with existing infrastructure and processes, the quicker gains emerge, such as cost reduction, increased IT capacity, and resources (Khayer, Bao, Nguyen, 2020).

Furthermore, competitive advantage relates to specific traits that facilitate organizational performance superior to competitors, whether natural resources, knowledgeable workers, geographical location, or access to disrupting technology like cloud computing. Organizations that focus on providing the best experiences for their customers create value through the product or services. The notion of strategic management is about developing these attributes and trying to sustain them (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

The constructs above help demarcate the study's boundaries and set a clear direction for the appropriate theoretical lenses to examine the objectives of this thesis. There is a vast amount of literature surrounding the critical success factors of cloud computing. With the immense body of research available and the continuous development of the cloud paradigm, the focus fell on the most recent study with a few exceptions generally. The ideas of a systematic literature review helped acquire an overview of relevant critical success factors.

## **2.2. Theoretical background**

This chapter investigates theoretical perspectives applicable to organizations transitioning to the cloud: Resource-Based View, Knowledge Management, Transaction Cost Theory, and Self-Determination Theory. They will set up the framework for data collection and analysis. The first subchapter will define Resource-Based Theory underlining the importance of resource orchestration to derive capabilities from cloud computing solutions and gain competitive advantages. The notion of Knowledge Management emphasizes how organizations learn and exploit knowledge. The third subchapter explicates the idea of outsourcing and unanticipated costs through the eyes of Transaction Cost Theory. Self-Determination Theory relates to motivation and its relevance to transformational change. These theoretical lenses are helpful to investigate critical success factors relevant for using cloud computing solutions and the benefit that may arise accordingly in an integral vision.

### 2.2.1. Resource-Based View

#### **Definition**

Resource-Based View (RBV) provides a strategic value assessment of information systems through the perspective of capabilities constructed by resources and competence. Thus, being of relevance to decision making in management. According to Barney (1991), organizations possess resources to create competitive advantages and enhance performance. His VRIO framework asserts organization's ability to possess valuable (V), rare (R), imitable (I), and organized (O) resources and capabilities simultaneously will determine performance (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

Information System (IS) or Information technology (IT) resources are composed of tangible assets such as infrastructure, employees, skills, commitment, and intangible assets such as organizational culture, management skills, competencies, and experience. Exploited IS resources may transform into capabilities by repeating actions to create products for a given environment to create a competitive advantage (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

#### **Resources**

RBV devises a framework for how organizations orchestrate resources and capabilities to compete in a market through strategies that permit expansion and diversification. Barney (1991) asserted these organizational strategies to include physical, human, and organizational capital. Moreover, according to Teece (1997), organizations may construct and integrate resources and competencies to create capabilities and configure them to attain competitive advantages. Makadok (2001) distinguished resources from capabilities. The latter embeds firm-specific organizational behavior instead of resources that may be acquired (Khayer, Bao, Nguyen, 2020).

#### **Capabilities**

Resource selection pertains to how organizations exploit superior knowledge to construct capabilities beneficial to be sources of competitive advantage. Capability building pertains to how organizations integrate, build and reconfigure resources to generate idiosyncratic competencies that weave into the company's fabric for superior value. Lower order capabilities are firm-specific competencies that enable basic operational capabilities. These are fundamental to function as an organization. The edge occurs when ordinary capabilities are developed into dynamic capabilities implying integrating and reconfiguring tangible and intangible resources to improve performance (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018).

Capabilities in the information technology context are frequent in the literature. Managerial IT capability relates to business knowledge and technical skills required to grasp the potential of emerging technologies and leverage technology to create strategic alignment with organizational objectives. Technical IT capabilities encompass tangible assets such as infrastructures and intangible assets such as expertise, problem-solving processes, and collaboration strategies. Relational IT capabilities imply establishing a fruitful long-term relationship with a stakeholder, such as using trust as a governance mechanism to safeguard a relationship. Such capabilities are highly dependent on management. IT business processes

integration relates to exploiting existing organizational processes within the business and IT to optimize organizational effectiveness and efficiency (Khayer, Bao, Nguyen, 2020). From an RBV perspective, these capabilities enable organizations to position themselves better than adversaries due to the specificity and non-transferability features of these heterogeneous capabilities and assets. Hence, impacting performance and attaining sustainable competitive advantage.

Moreover, managerial IT capabilities evolve instrumentally through history and vary across organizations. Construct such as knowledge, experience, relationships, trust, and interpersonal communication demands ample time to reach optimal and effective synchronized behavior. In addition, IT capabilities depend on various structural mechanisms and, consequently, the value derived from complicated interrelationships (Khayer, Bao, Nguyen, 2020).

Another dimension of IS capabilities evoked for improved organizational performance are infrastructure, human resources, and administrative IS capabilities (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

Infrastructure IS capability entails assembling technological structures necessary for business applications and information management vital to the organization, responding to external stimuli, and executing business initiatives. Proper infrastructure facilitates knowledge transfer by enabling standardization and automation of organizational processes, coding tacit knowledge into explicit knowledge. Moreover, flexibility in the infrastructure provides a system easily accessible and interoperable with other systems. Thus, all organizational departments can adapt and integrate the infrastructure according to business objectives. Therefore organizations who transform basic IT into IS infrastructure capability create competitive value (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

IS human resources capability enables proper utilization of technical capacity efficiently. It implies access to the right expertise, understanding the organizational culture and routines, and technological competencies. Appropriate human resources enable enhanced responsiveness, communication, and knowledge integration. Moreover, skilled human resources are better suited to combine IS and business processes, communicate with other departments more effectively, develop more cost-efficient applications, and proactively anticipate business and technological value-creating opportunities. In addition, according to Bharadwaj (2000), organizations that empower teams with autonomy, collaboration skills, and best practices enable IS employees to leverage their skills and deliver assets of the socio-technical networks in the organization effectively (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

IS administrative capability entails developing processes to sense, gather, organize, and propagate information across the organization. It involves instigating anticipated information behavior and values in employees. Leadership ensures performance monitoring, human resource management, planning, asset management, and resource allocation transform into such capabilities.

IS capabilities may engender value creation with adequate strategic information technology alignment and governance. According to Chen & Whu (2011), administrative capability help assess emerging technologies, organizational needs and coordinate with external parties accordingly. Effective administration reduces organizational redundancy and materializes strategies into operational initiatives (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

IS capabilities enable better decision-making, especially in the face of uncertainty. According to Huber (1984), technology enables organizations to spend less time on information retrieving, increasing competitiveness by making decisions more timely. Moreover, it decentralizes the organization during the decision-making process. It makes it easier to locate anomalies or opportunities for economies of scale through increased speed and quality across the organization. Making business processes more efficient spans organizational borders by increasing customer-centric operations designs. Thus, influencing economic variables such as return on sales and investment, costs, market shares, customer satisfaction, and loyalty, making the firm perform better (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

### **Agility**

Agility illustrates the ability to be aware of market changes, orchestrate resources, and offer novel services according to the dynamism and complexity in the environment by engaging with stakeholders, partners, customers, and employees. Thus, organizations might continuously position themselves to deal with change, anticipate and evolve their strategies to gain competitive advantages swiftly. The construct separates into three aspects. Operational agility refers to the organizational ability to react to innovation opportunities economically by reconfiguring internal processes for swift, rapid response. Partnering agility relates to the competence of an organization to employ absorptive capacity to exploit and explore strategic partnerships. Customer agility invokes organizations' ability to utilize customer relationships to derive market intelligence for competitive strategic initiatives (Liu, Chan, Yang, Niu, 2018).

### **Competitive advantages**

Organizations employ their capabilities to generate business value, thus demonstrating a value appropriation path of cloud computing solutions to gain strategic benefits (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018).

Investing in technology is highly relevant to thrive in a harsh competitive business climate. However, IT in itself does not create value. According to Porter (1985), integration of IT systems is not juxtaposed with increased competitiveness. Thus proper competence is needed to derive benefits. The combination of tangible and intangible resources generates business value. It preserves competitiveness, suggesting a holistic approach to IS capabilities that embody the organization to mitigate liabilities. Thus, derive benefits from implementing and using IT systems efficiently. IS capabilities imply strategic alignment planning to deliver swift and cost-efficient operations through experiential learning, strengthening organizational knowledge capacity. Therefore, enabling the probability of value creation in the face of changes in the business environment (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

Many organizations operating in today's business climate need to possess robust information technology (IT) / information systems (IS) capabilities to locate business opportunities, redesign best practices and processes, and foster organizational change (Amron, Ibrahim, Abu Bakar, Chuprat, 2019).

According to Nevo and Wade (2010), Information communication technology (ICT)-enabled resources realize more strategic gains than other resources in the organization separately. In general, ICT produces gains as the acquisition and distribution of these resources entail complementary resources with idiosyncratic characteristics (Shao, Yang, 2021). Again demonstrating the power of synergy effects and the importance of a holistic approach.

RBV and the use of capabilities to exploit technology are pertinent perspectives to adopt in the cloud context. However, it demands knowledge management, discussed in the following subchapter.

### 2.2.2. Knowledge management

#### **Definition**

Knowledge is classified as explicit, which is easily accessible, and tacit embodied in the intellectual mind of individuals (Imran, Bilal, Aslam, 2017). Polyani (1962) distinguished between explicit and tacit knowledge by calling the latter implicit (Schniederjans, Curado, Khalajhedayati, 2020).

Knowledge Management (KM) uses information flow through learning processes to impact organizational performance. According to Nonaka (1994), tacit knowledge derives from action, commitment, and involvement, thus hard to quantify, formalize and communicate. In contrast, explicit knowledge is codified and transmittable in a formal systematic scripture, therefore easier to standardize. The theory of knowledge creation implies a feed-forward and feed backward loop of organizational knowledge through socialization, externalization, combination, and internalization. (Schniederjans, Curado, Khalajhedayati, 2020).

Socialization requires physical interaction to permit tacit knowledge transfer. Externalization allows tacit knowledge to voyage and emanate across the organization's individuals, transforming tacit knowledge into explicit. Combination signifies modulating explicit knowledge into more complex forms. Internalization intends to transform explicit knowledge into tacit, allowing individuals to internalize specific routines (Schniederjans, Curado, Khalajhedayati, 2020).

#### **Exploitation & Exploration**

According to Nonaka and Toyama (2003), explicit and tacit knowledge iterate continuously across individuals, groups, organizations, and back to individuals. According to March (1991), knowledge management revolves around the friction between exploration and exploitation. The former implies the novel development of organizational routines. The latter suggest perfecting existing routines to refine knowledge. Combining these strategies may result in sustainable competitive advantages. According to Wilkesmann and Wilkesmann (2018), exploration strategy pertaining to innovation creation demands highly qualified personnel to exploit digitization (Schniederjans, Curado, Khalajhedayati, 2020).

In contrast, applying an exploitation strategy entails routine improvement, in which digitalization replaces low-qualified employees. The three pillars of knowledge management encompass people, process, and technology. Together they ensure acquiring, managing, and transferring knowledge in case of both exploration and exploitation (Schniederjans, Curado, Khalajhedayati, 2020). Moreover, according to March (1991), there is a trade-off occurring by organizations seeking to deploy strategies to balance between experimentation and capitalizing on the market to learn (Mahmood, Mubarik, 2020).

### **Absorptive capacity**

Technological absorptive capacity (TAC) relates to how organizations can absorb technology from the environment and operate in a dynamic business climate with enhanced innovative capabilities.

With industry 4.0 shifting sources of competitive advantage from tangible to intangible assets, intellectual capital (IC) becomes critical in leveraging those advantages. Developing organizational knowledge may lead to organizational ambidexterity, which balances innovation and exploitation activities to influence performance. Extant literature delineates IC into human, organizational and relational features.

Human capital (HC) includes an employee's skills, competencies, and capabilities through experiential learning and training. It may consist of institutional memory at the organizational level, such as the employees' skills, experience, know-how, and management expertise (Mahmood, Mubarik, 2020).

Organizational capital (OC) encompass all non-human sources of knowledge such as patents, information systems, corporate culture, organizational structure, trust, efficiency, routines, management philosophy, and relations (Mahmood, Mubarik, 2020)

Relational capital (RC) refers to the organizational reputation and customer loyalty, the intangible glue between the organization, external relationships, and the impact of those relationships. It includes trust, collaboration, goodwill, brands, customer satisfaction, distribution channels, and strategic alliances (Mahmood, Mubarik, 2020).

### **Organizational ambidexterity**

Ambidexterity is a crucial theoretical perspective when investigating organizational performance and competitive advantage. According to March (1991), finding an equilibrium between innovation capabilities (exploration) and refinement capabilities (exploitation) helps organizations engage in dynamic competitive environments. The tensions between exploitation and exploration may be conflicting but useful to mitigate organizational inertia caused by limiting responsiveness and lack of short-term achievements induced by future time-orientated actions (Binci, Belisari, Appoloni, 2019).

Organizations need to detain both capabilities to maximize value from the current IT infrastructure and discover new ones (Bian, Kang, Zhao, 2020). However, organizational inertia driving the organization to pursue exploitation initiatives may impede exploratory innovation activities due to uncertainties and risks, resulting in challenges to adapt to critical technological change. This effect is called the technology innovation paradox. Organizational ambidexterity mitigates this by exploiting existing capabilities to

improve operational efficiency and explore innovation to create future capabilities simultaneously. It enables incentive measures, information sharing, and organizational learning (Ouyang, Cao, Wang, Zhang, 2020).

### **Change management**

Change management is considered a critical success factor in implementing a new complex system. It requires a proper plan to effectuate the change, awareness of the project's needs, and build user acceptance. It also necessitates a positive employee attitude by educating various links on the benefits of using the system. Organizational culture is critical to foster change. Understanding cultural disparities and preferences from an organizational and geographical lens combined with business characteristics are inherent to construct a culture open for change. Hence, the need to boost employee morale by designing a stimulating work environment, recognizing employee effort, and mitigate employee retention (Finney, Corbett, 2007).

Change is constant in all organizations as they continuously alter strategies, cultures, and processes to align organizational capabilities with market requirements. Readiness change is critical for successfully implementing change as lack of knowledge may compromise viability and facilitate failure. It involves motivation, information sharing, and the persuasion of changing benefits through resource orchestration. The literature depicts personalization and codification as two coping strategies. The former implies that individuals known as change initiators approaching employees and supporting them in the change until they internalize the behavior. The latter entails centrally conveying messages through documentation to the employees to implement the change. A mixture of these strategies is also standard practice. Still, there is evidence that the personalization strategy yields better results than codifying strategy due to the personal coaching aspect of this strategy. The personal approach makes it easier to uncover difficulties and map employee competency, thus more effective for change management (Imran, Bilal, Aslam, 2017).

Organizations consist of human beings. Therefore, successful organizational change is contingent on accepting the change. Various factors influenced this propensity, such as experience, emotional intelligence, and organizational change management. Organizational inertia is a frequent and legitimate challenge. Anchoring effects, habitus, incongruent interests, erroneous communication, and lack of capabilities might make it hard to motivate change. It may engender adverse behavior such as disbelief, discontent, frustration, fear, and stress. Hence it is paramount for organizations to address these challenges through effective strategies and understand contextual factors such as cultural differences (Hechanova, Caringal-Go, Magsaysay, 2018).

Moreover, in process management, when employees must perfect and revive knowledge, expertise, and competencies through acquiring and creating new knowledge, task specialization is paramount to promote information sharing across groups. Getting everybody aligned on the meaning of metrics such as key performance indicators (KPI) may be demanding in change management. Converting knowledge and transferring it across groups should be assessed according to contextual settings to determine the appropriate strategy. Therefore, various factors enable the success of change management.

Furthermore, leadership is critical in establishing organizational culture, enabling effective business process management, managing resistance to change, nurturing a shared mindset, and fostering mutual absorptive

capacity among heterogeneous groups with different knowledge backgrounds and task responsibilities. Thereby leadership may promote ambidexterity and change (Binci, Belisari, Appoloni, 2019). This change might be challenged by the notion of ambiguity, pertaining to the perception of knowledge being different across individuals, thus being a potential source of conflict. Disparities in comprehension, uncertain meanings, low agreement level related to problem-solving processes may engender issues for change management. However, ambiguity may also serve as a tool to manage change by exploiting critical feedback, doubts, and resistance through collaborative behavior, specifically effective with employees able to recognize disparities and reconciliations. Again contextual factors come into play (Binci, Belisari, Appoloni, 2019).

External adoption and internal integration of operating systems have grown in importance for organizations in the face of organizational turbulence related to mergers and acquisitions, renewal, transformation, and technological breakthroughs. One example is the Banking sector continuously modulating according to consumer and industry demands. Management in this sector experience inertia and reluctance to adopt novel working methods. Knowledge management strategies are helpful by mitigating negative employee behavior and increasing readiness for change to ensure successful change implementation. Therefore, management should optimally develop personalization and codification strategies (Imran, Bilal, Aslam, 2017). According to Sundal (2012), findings from a Norwegian study revealed change management to be part of consultancy methodologies' critical success factor (Jæger, Bruckenberg, Mishra, 2020). Moreover, A systematic literature review on Change Management in global software development revealed critical success factors to encompass process engineering, overseas site response, information sharing, accountability, clear strategies, requirements traceability, roles and responsibilities, effective leadership, awareness, governance, vision, and goals, iterative communication, need for change, cost estimation, change impact analysis, training, top management support, and team motivation (Khan, Akbar, 2020).

Digital transformation pertains to the way people, processes, and technology are reconfigured in an organization. The motivation to engage with this change has various explanations but commonly entails altering organizational structures and business models to enhance organizational efficiency by leveraging technology (McCarthy, Sammon, Alhassan, 2021).

### **Talent management**

Transformational leadership is key to effective change management. It includes conveying a vision, modeling change, motivating, coaching, and nurturing an organizational culture prone to change. Change leaders need to consider the type of organization they operate in and tailor leadership strategies accordingly to induce commitment to change among employees (Hechanova, Caringal-Go, Magsaysay, 2018). Clemons (2019) and Wible (2019) portrayed the human factor as a negligible element when considering technological management pertaining to the importance of talent management. Research defines talent management as systematic, strategic, and organized organizational efforts to attract, develop and retain a talented workforce. Clark (2019) described talent management as employees' professional development to

increase performance in the workplace. The notion of talent management is a crucial part of the organizational process. It may include a set of human resources practices to facilitate organizational success and excellence. Thus, organizations may find it challenging to implement these strategic goals. Nonetheless, cloud computing increases the need for whole industries to invest in highly skilled human resources to obtain superior performance, enhancing the industry's competitive capabilities. Thus, activating talent management practices becomes decisive and facilitated through cloud computing (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

### **Collaboration**

Ability to manage also entails a necessity to collaborate. The construct of collaboration encompasses relational features such as information sharing, goal congruence, decision synchronization, incentive alignment, resource sharing, collaborative communication, and joint knowledge creation. It incites close strategic relationships where organizations engage in information, resource, and risk-sharing for mutual gains. It requires planning activities, integrating cross-functional processes, enacting supply chain goals, coordination functions, and establishing information sharing stipulators. Cloud computing enables collaboration by offering organizations differentiated access to information by enhancing transmission and improving collaborative communication (Schniederjans, Hales, 2016).

### **Strategic alignment**

For organizations to work effectively and unified towards a common goal, there needs to be alignment between relevant departments and decision-makers. Otherwise, sub-optimization might occur. Extant literature evokes issues regarding IT and business not grasping each other's perspectives, not speaking the same language or conveying objectives, changes induced by human error, failures or externalities, discrepancies between expectations and reality, or rigid legacy systems (Fuzes, 2018).

Business and IT objectives should align. These objectives must be communicated within the organization and the cloud service provider as part of an ongoing process (Bounagui, Mezrioui, Hafiddi, 2019).

Past research by McKinsey & Company revealed that approximately 50 percent of IT/IS projects surpassed initial budgets. Large projects exceeded budgets by 45 percent, their time frame by 7 percent, and provided 56 percent less value than predicted. Furthermore, 17 percent of projects were managed in a way jeopardizing the future existence of the company. According to McKinsey, merely a tiny percentage had improved their behavior in the digital age, and  $\frac{3}{4}$  felt the negative impact of digital competition in their earnings (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

Therefore, strategic informational technology alignment is critical for positive organizational performance.

### **Governance**

In terms of relational capabilities, corporate governance consists of devising solid incentives for a call to action, information sharing, and common goal seeking to ensure strategic alignment between supplier and chain partners, thus improving social and environmental performance. Organizations need to strategize, develop, align technical and relational capabilities (Jyoti, Shrimali, Mishra, 2019).

Cloud governance is defined as the set of organizational policies, processes, responsibilities, and capabilities necessary to manage and control cloud computing solutions according to business objectives. Thereby providing a framework to ensure proper adoption and usage of cloud technology (Bounagui, Mezrioui, Hafiddi, 2019).

Especially big companies are struggling with governance in the cloud era and its plethora of options. Since organizational departments can bypass IT departments to use cloud solutions, it has led to a negatively connotated trend called shadow IT. There are differing perspectives on this matter as it is considered a threat to corporate IT security while being beneficial to business productivity and innovation. On the one hand, shadow IT may lead to security and privacy issues, data loss, non-compliance with organizational security protocols, disruption of controlled environments and loss of synergies between departments, and resource conflicts due to opportunistic behavior. Users in the organization may be unaware of their detrimental or risky behavior.

On the other hand, bypassing the IT departments may increase productivity, saving time, enabling employees to focus on their tasks. Consequently, business innovation is enhanced, allowing organizational stability, helping employees adapt to organizational change. This duality may expose considerable liabilities and the *raison d'être* but also enable organizational capabilities. Therefore, governance policies serve as formal guidelines across the organizations. Nonetheless, it is inherent to mention that the positive perception of shadow IT pertains mainly to business leaders while the negative perception pertains mostly to IT leaders. This incongruence might pose a challenge to alignment preferred to govern the technology. There is consensus about the benefit and necessity of going cloud, but disparate views regarding how to control cloud solutions (Khalil, Winkler, Xiao, 2017).

Moreover, the way organizations configure their structure, processes, and governance policies enables them to exploit business opportunities and innovation to generate value. However, this requires solid and instructional key performance indicators to maintain oversight of processes, applications and optimize accordingly. This process should involve all relevant decision-makers, generally on the C-level, and be part of a continuous process revised occasionally in light of risks, changes, improvements to enable the organization to adjust and adapt. It is especially relevant in settings with a high degree of uncertainties and complexities, such as the cloud computing paradigm divulges. Among other contextual factors, regulations and compliance are also influential forces to be aware of when dealing with disruptive technology (Kauffman, Ma, Yu 2018).

Cloud computing governance initiatives must incorporate existing governance procedures to benefit from coexistence and cooperation with existing IT governance. IT rules related to cloud computing usage must be formalized into policies and revised according to changes. According to business needs, cloud computing governance permits organizations to quickly assimilate flexibility, scalability, and services in the cloud. Furthermore, governance ensures regulatory and contractual compliance, especially with contextual

differences between countries. Compliance permits tracking and assessing the impact of regulations and report breaches (Bounagui, Mezrioui, Hafiddi, 2019).

Corporate governance has increased in popularity since the many accounting scandals at the start of the 21<sup>st</sup> century. This construct includes proper financial auditing and encompasses information technology dimensions such as cybersecurity governance and cloud governance. As cloud migration is becoming increasingly abundant, so is the need for appropriate policies and protocols (Thuraisingham, 2020).

### **Competitive advantage**

According to Institutional theory, IT assimilation is compelled by the need for organizational legitimacy, which fosters institutionalization instead of competition. By assimilating IT innovation, organizations may impact the business climate, the rules of engagement, and novel ways to get the upper hand. Some researchers assert that environmental turbulence, uncertainty, and competition intensity inflates organizations' propensity to incorporate novel innovations (Wang, Liang, Ge, Xue, Ma, 2019).

Knowledge management (KM) is associated with creating, sharing, using, and managing information and knowledge in organizations. It enables a transformation of data into information and knowledge.

In data-driven societies and organizations, grasping the methods for extracting and exploiting knowledge is fundamental. Moreover, human capital is a critical antecedent in helping organizations adapt and compete globally. Human resources management may reduce costs and increase productivity (Johansson, Muhic, 2017; Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

With the transitioning to cloud involving a transformational and a transactional process, it is natural to discuss this in light of Transaction Cost Theory, the following subchapter.

### 2.2.3. Transaction Cost theory

#### **Definition**

Transaction Cost Economics (TCE) theory investigates transaction risks between organizations operationalized through make-buy or ally decisions, contractual solutions, buyer-supplier relationships, and sourcing strategy. Transaction cost arises in settings where actors limited by bounded rationality engage in transactional exchange relationships. Thus, actors must behave in an economically efficient manner by minimizing transactions. A critical liability in organizations is opportunistic behavior induced by bounded rationality putting constraints on human behavior. Thus, resulting in intentional or unintentional adverse behavior, reducing communication and processing in a business transaction (Schneiderjans, Hales, 2016). Nonetheless, erratic customer demand and elevated in-house cost of production attract organizations to outsourcing non-essential business activities (Prajapati, Kant, Tripathi, 2020).

## **Incomplete contracts**

TCE emphasizes the importance of minimizing transaction costs by looking for solutions that maximize value for all parties involved in a transaction (Schniederjans, Hales, 2016). It permits the study of information asymmetry between vendors and customers. Customers seek oversight of a transaction by adopting the method for its governance, such as contractual governance. Nonetheless, literature asserts that contracts are incomplete due to information asymmetry or that one cannot make every detail explicit for any given context during a transaction. That would be an almost impossible and very inefficient task (Maklouf, 2020). The dimensions of asset specificity, performance measurement difficulty, and uncertainty level are the three pillars of TCE (Schniederjans, Hales, 2016).

### **Asset specificity**

Asset specificity relates to the degree of specific value an investment retains in a respective transaction. The higher the specificity, the harder it is to apply that value to other business areas. The more intertwined involved parties become, the more the resource's value is constrained to that specific relationship (Schniederjans, Hales, 2016). According to Williamson (1985), asset specificity is considered a long-term investment to support a particular decision. The alternative cost relates to how specific that investment is to the project and the discarding of the investment. The more tailored the investment is to the transaction, the higher the asset specificity. In a cloud context, this means moving across cloud vendors in a lean manner, customize cloud service, and all other costs related to supporting the cloud solution, including switching provider, change management, services, and business process reengineering (Maklouf, 2020).

### **Performance measurement difficulty**

The level of performance measurement difficulty determines the extent to which a given transaction offers exact cost and benefits to the parties involved. Information asymmetry is a frequent source of performance measurement difficulty. The superior computing power of cloud computing mitigates this discrepancy through rapid deployment enabling better analyzing and storage capabilities, effective information sharing, coordinating, and planning. Thus, decision synchronization is improved, increasing consumer market responsiveness. In addition, collaborative knowledge creation diminishes service-level challenges (Schniederjans, Hales, 2016).

### **Uncertainty**

Uncertainty refers to unforeseen changes concerning the transaction in question. Cloud computing lessens uncertainty due to superior information sharing capability on many platforms regardless of location or type of platform. Thus, alleviating the risk of transaction cost and its impact on collaborative communication. Furthermore, the virtualization capability of the cloud relieves organizations of the necessity to invest in costly IT equipment to store and transmit information. CC maintains data centers with minimized effort (Schniederjans, Hales, 2016). In a cloud context, legal compliance, monitoring, and contract management determine the level of uncertainty. In combination with the cloud transaction frequency and asset specificity, organizations can discern a holistic perspective of transaction costs related to transitioning to the cloud (Maklouf, 2020).

Furthermore, environmental turbulence relates to unpredictable interruptions in the environment, such as market or technological disruption, which may negatively impact organizations by enabling conflicts and performance liabilities. Hence, technology absorption capability is critical (Shao, Yang, 2021).

### **Trust and relational governance**

Trust encompasses an individual's beliefs and expectations that all parties in a transaction or relationship will exhibit socially appropriate behavior and not engage in opportunism. Trust is a social mechanism that regulates social complexity by mitigating adverse behavior. This notion applies to the cloud paradigm as end-users must trust their provider to act ethically, thus mitigating information asymmetry related to complex decisions in the face of uncertainty. Which in turn may increase purchasing decisions and recurrent purchasing behavior. Evidence suggests trust to moderate the relationship between perception of risk and behavioral intention (Garrison, Rebman, Kim, 2018).

One way to enforce trust between vendor and customer is through Service Level Agreements. The latter is correlated to customer satisfaction as it is a negotiation between price and quality of service between cloud service providers and customers. (Schniederjans, Hales, 2016).

### **Competitive advantage**

Outsourcing is common, especially among small and medium enterprises (SME). Most organizations face a make-buy or ally decision (Asiatini, Penttinen, Kumar, 2019). However, in business transactions between vendors and customers, price is not juxtaposed with the cost of the solution. The transaction itself may engender additional unforeseen costs (Maklouf, 2020).

TCE is a well-suited theoretical perspective to exploit the advantages of outsourcing for business benefits purposes by investigating various outsourcing alternatives and assess costs related to managing, monitoring, and controlling a transaction (Maklouf, 2020; Prajapati, Kant, Tripathi, 2020). Through the lens of TCE, it is possible to get a sense of how cloud computing might mitigate transaction risk and facilitate collaboration (Schniederjans, Hales, 2016). The critical success factors of outsourcing apply to cloud sourcing as the motivation to go cloud may involve economies of scale and demand pooling (Maklouf, 2020).

Organizations who adopt this way of thinking are better suited to improve economic efficiency by assessing unexpected costs when engaging in business transactions in competitive environments. However, organizations can benefit from nurturing their strengths from within. Employees are the cornerstone of any organizational success. Thus this chapter's last theoretical aspect involves Self-Determination Theory.

## 2.2.4. Self-determination Theory

### **Definition**

Ryan and Deci (2000) define Self-Determination Theory (SDT) as an organismic approach to human motivation and personality in a social context applicable in a working environment, among other relevant life domains. The backbone of the theory centers around the need for autonomy, competence, and relatedness (Williams, Halvari, Niemiec, Sørenbø, Olafsen, Westbye, 2014). SDT asserts that a degree of satisfaction of particular basic innate psychological needs impacts the perception of control of action and the motivation to perform that action. If individuals feel restrained by others in their efforts, motivation may be compromised (Li, Chang, Wang, 2020). According to SDT, individuals seek to satisfy basic psychological needs such as continuous personal growth, integrity, and well-being before executing a volitional task. These needs define personality dispositions that energize and direct individuals towards valued opportunities. Hence underlining how to estimate motivation and behavior in a given context to make employees realize their fullest potential (Li, Chang, Wang, 2020).

### **Basic psychological needs**

Three fundamental needs encompass the theory.

Autonomy illustrates a sensation of volition and self-endorsement, a type of automated self-governing mechanism. The higher the sensation, the higher the perception of freedom, empowerment, or meaningful rationale, leading to increased ownership of actions. Competence refers to the need to experience and achieve desired outcomes, thus, facilitating subjective perception of confidence to adapt to fluctuating environments. Experiential learning influences the perception of competency.

Relatedness invokes the experience of mutually caring and nurturing relationships when engaging in activities in a social milieu. A climate conducive to fairness, respect, and mindfulness stimulates individuals' sense of security to operate in an environment (Williams, Halvari, Niemiec, Sørenbø, Olafsen, Westbye, 2014; Li, Chang, Wang, 2020).

Managers adopting an employee-centric attitude by recognizing, encouraging, conveying confidence, inducing skills building, providing feedback, and unconditional positive regard may significantly impact employees' work behavior (Williams, Halvari, Niemiec, Sørenbø, Olafsen, Westbye, 2014). Subsequently, it may be relevant and exploited in technology adoption such as cloud computing.

When these basic psychological needs are satisfied, employees may be intrinsically motivated to engage with cloud storage adoption and social networking usage. Hence, it is critical to nurture an environment to support these needs and influence organizational behavior (Li, Chang, Wang, 2020).

SDT shares commonality with transformational leadership, which is highly relevant in today's business climate regarding leadership, organizational culture, governance, resource orchestration, and technology savviness (Williams, Halvari, Niemiec, Sørenbø, Olafsen, Westbye, 2014).

This theory is highly relevant in cloud solution usage and the change management necessary to transition to the cloud. Motivation is critical to combat inertia as stress may be detrimental to organizational performance. Organizations are built and driven by people, but technology is only a means to an end. Thus, being aware of the underlying mechanisms of human interaction and how to leverage them is beneficial.

Despite the many benefits of cloud technology, a holistic picture is not complete without analyzing the pitfalls of the paradigm. The following subchapter seeks to clarify some of them.

### 2.2.5. Cloud challenges

This chapter underlines potential challenges of the cloud computing paradigm relevant to the research questions and the study's objectives. Regardless of the many benefits of CC, considerable challenges occur, and reservations towards the disruptive technology are present and well-founded. Customer failure is a significant obstacle to consider. This final subchapter concludes the theoretical framework by providing additional knowledge to incorporate when pursuing data collection and analysis relevant to the thesis.

#### **Security**

Many associations face the challenge of uncertain economies, business globalization, and numerous technological changes in the twenty-first century (Prajapati, Kant, Tripathi, 2020). The gravity and reality of security risks related to CC and technology, in general, are not overstated. However, these issues are not born with CC but follow the continuum of technological development. There are plenty of mentionable contemporary examples to validate this point. Google, Microsoft, Amazon have experienced significant risks related to network, web application, data storage security such as phishing, downtime, data loss, and password weakness (Birje, Challagidad, Goudar, Tapale (2017).

Nonetheless, it is crucial to regard these risks as a challenge, incentive, and opportunity instead of fear. This approach may facilitate the usage of cloud computing to create and innovate value. There is reluctance due to issues pertaining to data security, privacy, and lock-in effects. The cloud paradigm has been regarded as a business hype in the IT sector, but organizations need to grasp the value-creating benefits of this disrupting technology (Sharma, Gupta, Acharya, 2020).

#### **Loss of control**

The publicly shared resource characteristic of cloud computing might pose a challenge to data security as data is critical to an organization in today's data-driven society. Cloud-based software is dependent on installing severe security measures to protect the cloud, its administrators, and end-users from harmful activities. Fear of losing control over the outsourced tasks is real (Asiatini, Penttinen, Kumar, 2019).

Also, loss of governance as organizations relinquish control over IT infrastructure and employees and rely on CSP implementation of governance elements is an understandable concern. However, unauthorized cloud usage occurs because of accidental or unintentional data storage given user ignorance or lack of knowledge regarding information security threats. Awareness regarding security liabilities in the cloud environment due to threats of loss of sensitive data and money are considerable. In 2010, Amazon network host service S3

encountered a system failure lasting for hours, making people aware of the risk related to cloud data storage. In 2012, A Dropbox employee's account was compromised. In 2013, hackers took complete control over an amount of Facebook accounts. The same year, classified information about the National Security Agency, among other agencies, was disclosed to the public. It stated they could obtain electronic data from third parties such as telecommunication and internet providers via secret court orders specified by USA Patriot Act and the Foreign Intelligence Surveillance Act (FISA). This major incident engendered concerns about the appropriate access to an individual's digital information in the USA and other countries, further impacting the use of public cloud providers and compromising the adoption of cloud technology. In 2014, Snapchat was attacked after researchers published security information exploit in the social media platform. The business paradigm trend for migration to cloud computing has generated resistance regarding security issues in this state-of-the-art data outsourcing. Incidents such as the Edward Snowden declarations in 2013 make this organizational behavior understandable. Nonetheless, cloud technology is more used than ever before (Birje, Challagidad, Goudar, Tapale, 2017; Garrison, Rebman, Kim, 2018; Bouaynaya, 2020).

### **User experience**

Cloud computing delivers services according to user demand and requirements. A user request will determine the layout of the service, and the provider assesses needs, designs, and schedules resources to the server, respectively. Hence, challenges might present themselves, such as network scalability, resource allocation, dynamic resource allocation, maximization of profit, price discrimination, cost, scheduling, resource provisioning, and load balancing. For example, to satisfy customer needs, SaaS vendors lease resources from IaaS that may vary in performance, thus impacting the quality of service. Therefore, load balancing ensures an effective and fair distribution of resources to mitigate system overload. Nevertheless, it has become a problem for CSP when faced with many end-users (Jyoti, Shrimali, Mishra, 2019).

The extant literature underlines the challenges of going cloud, including data security, elevated set-up costs, cloud model designs, the right set-up, dependency on cloud service providers, real-time monitoring requirements, and cost barriers to cloud management and data recovery. Thus, making organizations more reluctant to accepting cloud computing solutions. Providers should persuade organizations of their capabilities to handle security liabilities to facilitate increased trust in cloud computing. Moreover, external expertise, user experience, and business continuity are critical factors to promote proper cloud computing solutions that demand more research (Amron, Ibrahim, Abu Bakar, Chuprat, 2019).

Furthermore, the reliability of the cloud computing environment is considered a critical challenge. Cloud data centers consist of complex, extensively intertwined, and interdependent systems that enable significant threats to system failures and software inconsistencies induced by environmental change. The potentially disastrous consequences require assessing the reliability and performance assurance related to any types of loss as increasingly more organizations go cloud (Buyya, Srirama, Casale, Calheiros, Simmhan, Varghese, ... & Shen, 2018).

Finally, A considerable challenge of cloud computing is the authorization of access to cloud data. The benefit of cloud-enabling sharing of resources and collaboration also presents a risk related to trust in the technology and the providers. Organizations lack trust in cloud computing beyond the technology itself, such as lack of transparency, loss of control, and vague security assurance. Thus transitioning to the cloud is a decision made with a high degree of prudence (Jones, Irani, Sivarajah, Love, 2019).

The different theories discussed paint a particular picture of the critical success factors for organizations transitioning to the cloud. The challenges evoked in the chapter mentioned above supplement this framework. Extant literature depicts clear benefits of cloud computing but does not exclude the pitfalls of engaging with this disruptive technology. This chapter served as a background for ensuing research. The theoretical perspectives mentioned may be interpreted as excessive but were deemed necessary for a complete picture. Especially since these theories are well engrained and validated theoretical perspectives, their combined use may strengthen the propositions argued by the study.

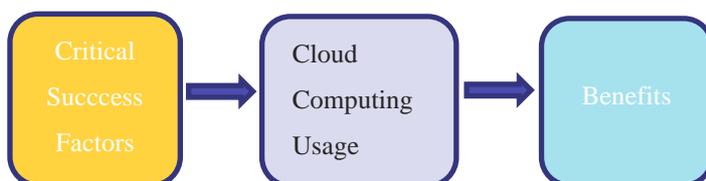
The thesis proceeds with a justification for the study's approach in the method chapter.

### 3. Method

This chapter underlines the methodology pursued, the justifications for decisions, and methods related to data collection and analysis. After presenting the conceptual model, the first subchapter explicates the research paradigm. The second subchapter untangles the rationale for the chosen design. The following subchapters concern data sampling, collection, and analysis, respectively. The last subchapters clarify issues pertaining to validity, reliability, ethical concerns concluding with researcher bias and presenting the units of analyses.

#### Conceptual model

The study's focal aim is to understand critical success factors when organizations envisage cloud computing solutions and the benefits achieved from the utilization. The following conceptual model visualizes the study's objectives enabling readers to retain an overview and associate the research questions across the study.



### **3.1. Research paradigm**

According to Kuhn (1962), a paradigm is a set of beliefs to which a specific curriculum adheres relatively to assumptions attributed to the respective world. According to Sale, Lohfeld, and Brazil (2002), scientific paradigms are defined by ontological and epistemological perspectives. Onto means “being,” logia means “science,” and episteme means “knowledge” in Greek (Slevitch, 2011).

The view of the world impacts research. According to Chua (1986), it includes beliefs about a phenomenon, the notion of knowledge, and the relationship between knowledge and the empirical world (Orlikowski, Baroudi, 1991). These beliefs of underlying mechanisms about knowledge and the practical world chosen will echo through the study. Previous literature will enable raising relevant research questions. Thus, examining critical factors to improve organizational behavior in a cloud context.

An ontology defines the nature of reality. Epistemology clarifies the belief about knowledge. And methodology concerns the principles of scientific investigation. They assert a specific research method based on a particular theoretical structure delineating assumptions about reality, human nature, society, study principles, and legitimate knowledge doctrine (Slevitch, 2011).

Ontology concerns the nature of the reality of a phenomenon, whether the world is objectively independent of humans or exists only through the subjective interpretation of human behavior. Furthermore, beliefs about rationality are relevant. In a transaction relationship, individuals may be bounded by rationality due to limited access to information and prone to utility-maximizing. Social relations between people in organizations are dynamic and conflictual (Orlikowski, Baroudi, 1991). As such, this thesis adopts constructionist ontology.

Epistemology relates to the assumption about knowledge, how a specific phenomenon is constructed and appraised. Chua (1986) classified epistemology into positivist, interpretive, and critical (Orlikowski, Baroudi, 1991). From an interpretive epistemological perspective, the social process is not constructed through hypothetical deductions and statistics but immersing into the phenomenon of interest, grasping social reality through meanings formed and informed by language and tacit norms shared by individuals interacting. A circular perspective is adopted to understand the actor’s view of their social world (Orlikowski, Baroudi, 1991). As such, this thesis adopts an interpretive epistemology.

According to Guba and Lincoln (1994), ontology defines epistemology, which underlines methodology and appropriate method. Methodological assumptions determine the proper methods and techniques to apply for collecting empirical evidence. Perception of reality defines knowledge construction and its acquisition which finally defines applicable research technique. Qualitative research traditionally derives from constructionist ontology and interpretivist epistemology (Slevitch, 2011).

Interpretive information systems assert social world is created and bolstered by human interaction, making it challenging to measure objectively. Thus, the chosen philosophy is the interpretive approach as it seemed applicable to organizational and information system studies. Interpretivism views reality and the knowledge of it as social products. Social actors create reality through social processes extending human consciousness and subjective experience. The goal is to grasp relationships and dynamics of how it is enacted by instigating meaning. With the evolution of technology surpassing the rigidity of objective structures, it seems interesting to investigate underlying mechanisms through the tacitness of human interaction enabled by technology and its potential benefits.

Constructionist interpretivism was deemed correct in this study. It would define the social process to capture the complex, context, and time-dependent, dynamic social interactions regarding an organization's use of cloud computing solutions. Thus, being fruitful in understanding factors facilitating organizational success and engendering benefits from cloud computing (Orlikowski, Baroudi, 1991).

### **3.2. Research design**

According to Scapens (1990), design may be descriptive, illustrative, experimental, exploratory, and explanatory. The correct research design is crucial for developing good research questions and producing valuable findings. According to Eisenhart (1989), Dyer and Wilkins (1991), deciding whether prior theory should advise the research questions and data collection is evident. The literature review guides empirical observation appropriately (Vaivio, 2008).

The cloud phenomenon is context-dependent, and as it keeps evolving, the goal is to understand the underlying mechanisms and organizational behavior related to cloud computing usage. An exploratory design is attractive since the phenomenon of interest may have unclear boundaries, thus enabling rich deep data (Vaivio, 2008). As such, an exploratory design was chosen for this study.

### **3.3. Research approach**

The five conventional qualitative approaches are narrative research, phenomenology, grounded theory, ethnography, and case study. Qualitative research is a process that arises inductively to understand a phenomenon through open-ended questions used to collect information and coded into themes. The problem statement should indicate the source of the issue and trace a parallel to the literature review to identify a need. Research designs should be designed within a single approach but may overlap and mix (Slevitch, 2011; Lewis, 2015). A case study seemed pertinent for the study. Building a report by acquiring knowledge from relevant industry experts would generate information in line with the research methodology. The goal was to understand the cloud computing phenomenon in today's business climate and possibly gain novel insights.

### **3.4.Data sampling**

The data sampling involved defining a sample by specifying inclusion and exclusion criteria and determining sample size. Then, selecting a sample strategy. Finally, defining the sample sourcing, including advertising, avoiding bias, and ethical considerations. Data sampling determines the coherence, transparency, impact, and trustworthiness of the research project (Robinson, 2014).

Inclusion criteria encompassed organizations that had a meaningful relationship with cloud computing. It comprised cloud service providers, cloud service users, and firms with expert power in cloud technology. Furthermore, multinational organizations were selected to generate holistic knowledge that was not constrained to a specific geographic location.

Exclusion criteria covered any organizations that did not possess expertise relevant to provide valuable insight to the study.

Being adaptive by monitoring and responding to the practical realities is essential in qualitative research as many factors may not be anticipated. As it was challenging to acquire participants and given the resource constraints, the sample size was reduced from 10 to 5 initially due to slow response. Eventually, 9 participants were nonetheless willing to participate. Given the time constraint caused by the late acquiring of participants, it was estimated enough to proceed with the study. Theoretical saturation was not reached, but the selected units' quality was quite satisfactory. However, more participants approached with a willingness to participate too late in the process, and the decision was made to reject their offers kindly.

Purposive stratified sampling was appropriate due to theoretical a priori knowledge about the phenomenon evoking certain features to be important in the sample. In a stratified sample, particular groups are selected, stratifying the sample into those groups and the target number of participants allocated to each group (Robinson, 2014). In this study, the sample included information technology organizations such as cloud service providers, consultants, and cloud solutions vendors. The aim was to get three from each group. However, six cloud providers, two consultancies, and one cloud solutions vendor were acquired.

The recruiting is limited to the researcher's dexterity to disseminate the research. An online search helped discerning relevant organizations for the analysis. Furthermore, the website [cloudtango.org](http://cloudtango.org) was discovered and unveiled a list of 48 organizations. In addition, e-mail, Facebook, and LinkedIn served to scope, research, and approach the leads. Most organizations were approached by telephone, mail, or website during the same week. The project was pitched effectively by presenting the study's objective, research question, reassuring the ethical aspects, and ensuring the project development according to research protocol. A template provided by Norsk Senter for Forskningsdata (NSD) was conveyed to the participants with all the information related to ethical research. Data collection through online interviews eradicated the location obstacle and logistic costs, hence alleviating some resource constraints for the participants and the researcher (Robinson, 2014).

Gatekeepers may encourage participation if convinced and champion the study (Robinson, 2014). In some cases, gatekeepers required persuasion for me to gain access to interviewees. There were mixed responses to the inquiries, but most adhered to the study's purpose and value.

Snowball sampling was another recruitment strategy employed (Robinson, 2014). The first recruitee was asked for referrals qualified to participate due to the lack of participants acquired and time constraints. The strategy was moderately successful as the first participant referred to two leads, subsequently becoming participants. However, the snowball melted there.

All participants were approached relatively the same way, only differing in the technology used to initiate contact. A financial incentive for participation was evaluated but quickly rejected.

The likelihood of increased involvement may have compromised the neutrality and sincerity of the data collected (Robinson, 2014).

This process was iterative and fluid without compromising coherence nor transparency (Robinson, 2014).

### **3.5.Data collection process**

To the best of my knowledge, it was beneficial to employ digital technologies and exploit the Internet in the study. Primary data consisted of semi-structured interviews. Secondary data encompassed scientific articles. Considering the contextual factor presented by Covid-19, the use of Zoom to record the interviews was practical. However, it was paramount to inform and get acceptance for data recording. Recording ensured holistic data gathering as access to verbal comments, body language, and setting provided an ethical collection (Palys, Atchison, 2012).

The use of the Internet proved helpful to the integrality of the research. However, it is necessary to mention ethical issues related to technology, such as the blurred lines between private and public and "netiquette" regarding approaching and interacting with various social networking groups. Confidentiality and data security are paramount concerns in the cloud computing paradigm and research and society in general (Palys, Atchison, 2012). Digital data collected through internet interviews was computer-assisted, thus presented relevant issues. It was essential to secure collected data by anonymizing as soon as possible, encrypting sensitive information, and storing properly (Palys, Atchison, 2012). Thus, a portable plug-and-play storage device WD My Passport, with secure backup software and data hardware encryption, was acquired.

There is a critic to be raised towards cloud computing because of relinquishing control, thus putting significant pressure on the researcher to manage data properly and choose appropriate technological tools accordingly. It may raise concerns, especially in cloud computing, where information is stored on external servers. Gmail was employed to communicate with the supervisor and engage potential interview inquiries. It might entail a loss of control which can be disputable in research. Other parties' policies might impede the rights and interests of researchers. University-based web and data servers may be subject to hacking or be

subject to policies allowing for extensive inspection of any information and management, which may compromise confidentiality (Palys, Atchison, 2012). It was assumed that the University of South-Eastern Norway to be well equipped and morally engaged in securing academic freedom and research participants.

### **3.6.Data analysis**

The main focus fixated on critical success factors related to the decision-making when considering a transition to the cloud, revealing the benefits of cloud computing solutions usage. Information from collected data was examined to delineate recurring themes and arguments relevant to the analysis (Ross, Blumenstein, 2013). As such, a thematic analysis was conducted.

After collection, interviews were listened to once in their integrality without noting and a second time by reporting down critical comments, then transcribed into Word files. Furthermore, the reputable information management software program NVivo analyzed the qualitative data. This process was quite time-consuming. The coding process involved an inductive coding technique. Open coding was employed to name and categorize phenomena by closely scrutinizing the data. The latter was broken into smaller parts, examined, compared for commonalities and differences. Furthermore, questions were asked about the phenomena reflected in the data (Finney, Corbett, 2007; Palys, Atchison, 2012).

### **3.7.Validity and reliability**

According to McKinnon (1988), qualitative research may use scrupulous data collection to produce reliable and valid empirical evidence. A theory is considered a local description and a temporal creation pertaining to a different ontology and epistemology in qualitative research than quantitative research. Theory emerges from the local context and is limited by specific features. Proving statistical generalization is not the aim, but instead, a theory emerges, has a lifespan, and fades (Vaivio, 2008). This study's goal was not to build or extend any theory. But it followed the logic of seeking clarification and understanding. Nonetheless, the construct of validity and reliability were still considered.

Descriptive validity is essential since the description is fundamental in qualitative research. It may be attained through investigator triangulation by allowing multiple observers into the research setting to strengthen credibility (Johnson, 1997). It was not effectuated in this study. However, recorded interviews allowed for some validity of the account taken place.

Interpretive validity describes how accurate the meaning of participant expression is being reported. It is crucial to establish a window in a participant's mind to grasp their behavior and expressions; thus, their perceptions of their phenomenological world provide a valid account of perspectives (Johnson, 1997). Interview transcripts were available to the participants, and most interviewees were available for ex-post feedback interviews for potential clarification or need for additional information. In addition, the findings were interpreted in light of actual expression, not extrapolated or taken out of context.

Theoretical validity is more subjective and refers to how a phenomenon develops and why it operates as it does (Johnson, 1997). The literature review and theoretical framework were elaborated mainly through the lens of Resource-Based Theory, Knowledge Management Theory, Transaction Cost Theory, and Self-Determination Theory seeking a certain theory triangulation by examining a phenomenon from a multi-theoretical approach.

The study was not peer-reviewed, nor was another researcher present during the interviews, but a supervisor oversaw the research.

Moreover, interviews as a primary source of evidence must be sufficient within the unit of study and prepared correctly to minimize respondent bias and politicize the project. Also, careful qualitative research includes various data sources enabling triangulation between different empirical material to increase reliability. To further mitigate theoretical myopia, findings from the study should be compared to the literature, possibly tracing relevant lines by cross-examining without rediscovering the wheel. Thus, strengthening the external validity of the research (Vaivio, 2008).

A comparison was effectuated to some extent, even though generalizability was not a focus.

Furthermore, triangulation may be employed in qualitative research to test reliability and validity and establish truth in a contextual setting instead of statistical inference. The goal is to attain illumination and extrapolation to similar circumstances (Golafshani, 2003). Triangulation enforces the credibility of the research by reducing potential biases engendered by a single source (Bowen, 2009). In this study, information from the interview transcripts and research articles was analyzed and combined to obtain an overview enabling better assessment.

Reliability in qualitative context is related to increased understanding. Therefore, constructs such as credibility, neutrality, confirmability, transferability, and consistency are more descriptive of reliability in the qualitative approach. Moreover, trustworthiness is paramount to qualitative validity and reliability in exploring subjectivity and reflexivity (Golafshani, 2003).

Data sources triangulate trustworthiness by mitigating reactivity, researcher, and respondent bias, thus instigating credibility. According to Yin (1994), different sources may include documents, interviews, and participants. It is paramount to deduce the authenticity and usefulness of documents and conduct research transparently (Bowen, 2009). Three business reports were initially included in the study as multiple sources of evidence to analyze points of convergence and corroboration. The source was Gartner and Forrester Research, reputable organizations devoted to helping businesses flourish with their customers. However, after careful consideration, these documents were discarded to reduce potential bias.

Moreover, articles were carefully selected by mainly choosing articles from journals with impact factors between 7 and 10 to ensure the quality of the articles. Also, citations and peer-reviewing were essential in the literature review.

An overview of the articles is available in the reference chapter.

Furthermore, qualitative methodology seeks to provide transferability of experiences of a given phenomenon rooted in the richness and complexity of descriptions. Hence, rendering the sample size irrelevant as the intention is to provide meaning and not testing hypotheses to enable representation and generalizability (Slevitch, 2011). The sample size of 9 was considered valuable enough pertaining to quality over quantity. The selected interviewees were potential goldmines of knowledge offering great value to the study. Also, vigorous data recording, transcription, and evaluation increased the reliability of the qualitative research (Lewis, 2015). Therefore, the choice of the data collection method was satisfactory.

In addition, a lack of a robust theoretical orientation may anchor a specific perspective endangering empirical subjectivity, potentially compromising empirical insights. The qualitative approach was always envisaged with as little interference as possible not to compromise the research. In line with the decision to explore and understand, the literature review provided direction without a high and rigid degree of determinism. The questions in the interviews were as vague as possible to reduce researcher bias and enable the participants to express themselves freely. A casual tone made the setting as comfortable as possible.

I conclude that the theoretical foundations served as additional data enabling relative triangulation and promulgating a sense of helpful direction to pursue. The primary data emanate from the in-depth interviews. The analyses combined with extant literature provide rich insights. The construct of reliability and validity were considered in the research. The extent to which they are validated may be subject to scrutiny.

### **3.8. Ethical considerations**

This study was conducted in line with ethical rules by mindfully approaching any counterparts, looking to minimize harm, manage data responsibly, and considering effects on participants. Informed consent was obtained, and the notion of “do no harm” consistently applied according to the European Union General Data Protection Regulation (GDPR) and non-disclosure agreements (Bell, Bryman, Hartley, 2019).

Information about interviewees and their firms was anonymized and coded to guarantee confidentiality and ethics. Every approached subject was informed of the study's purpose, online recording interview, and the possibility to anonymize any information or retracting from the study at their discretion.

A high level of transparency and trust characterized the study. Also, participants expressed the want to acquire a copy of the thesis, a claim naturally indulged as a token of appreciation for having participated and shared their knowledge.

### **3.9. Researcher background and bias**

Some preconceived assumptions are inevitable as humans are not robots. Still, it is crucial to maintain distance from the examined setting not to live the same faith as “the sociologist that went native.” (Vaivio, 2008). There was a consideration of homogeneity versus heterogeneity in the data sample.

Heterogeneity might be helpful if commonalities are discovered across a diverse selection, thus being more prone to generalization and identifying results potentially applicable across contexts. A well-collected sample increases the context, rigor, transparency, coherence, therefore the study's validity. I deemed it to be satisfactory in this thesis despite 9 participants. Again external validity was not the goal. The small sample mitigated too vast submersion in data and voiced the participants instead of anonymizing them in a larger group (Robinson, 2014). In retrospect, it could have been helpful to have more interviews representing cloud service users to get in-depth knowledge from both sides of the table.

Researcher bias is an obstacle as anchoring and selection bias may imply looking for favored events and writing up results accordingly. Because the design was exploratory, resulting from selective observation and recording of information, personal interpretation could cloud data interpretation and the research methodology. Appropriate reflexive consideration of any conflict of interest improves transparency. Therefore, reflexivity was considered in the thesis, especially since it was written single-handedly during the current pandemic. It increased awareness, monitored biases, and contained them to a certain extent. Continuous self-reflection effectively mitigates interpretation dissonance and other challenges when employing a social constructivist approach (Johnson, 1997; Robinson, 2014; Vogl, Schmidt, Zartler, 2019).

Finally, the theoretical insight from the qualitative study could have been complemented with a survey to enable construct validity hence strengthening external validity further (Vaivio, 2008). Due to time restrictions, this was not possible. The study's goal was to enable coherent, rich, and relevant knowledge about the cloud computing phenomenon in light of its recent, considerable development during the digital revolution, further spiked by the current pandemic. Interpretive methods allowed freedom of expression within boundaries of the research context as the primary objective was to describe, analyze, and understand reality from the actor's perspective (Orlikowski, Baroudi, 1991).

Qualitative research is explorative in its nature, enables inductive analysis, comprehensive perspective, qualitative data utilization, individual contact, and in-depth understanding. This approach yields meaningful observations by analyzing a small sample and generating knowledge for ulterior research. A caveat presents itself when provided information is insufficient, evoking increased subjectivity, thus compromising the reliability and validity of the data. A proper research strategy is crucial to executing a satisfactory study (Chang, Chang, Liao, 2020). These rules were applied to the best of my knowledge.

### 3.10. Units of analyses

Before reporting the actual findings, the preceding table gives a comparative overview of the interviewees, their responsibilities, and the industry in which they operate. The sample was relevant to the study in question and presented extensive rich deep data to immerse in. Each company was coded with a letter to ensure their confidentiality and quotations accordingly.

As previously mentioned, the sample was limited in number. However, it provided valuable information to answer the research questions. Most interviewees were very experienced, with one unit of less experience in the cloud, which provided invaluable insights from another perspective. The quality and amount of data extracted from this sample were beneficial to the study.

*Table 1-1 Unit of analyses*

N	Code	Role	Responsibilities	Years of experience	Industry	Type of organization
1	A	Chief Technology Officer	Create products, marketing and communication	25	Oil and Gas and renewable energies	Norwegian cloud service vendor
2	B	Account Executive	Sell software, consultancy	11	CRM	International CRM cloud software vendor
3	C	Certified Cloud consultant	Primarily administrate and help customers with existing environments or moving into the cloud	2	Technology	Norwegian cloud service provider
4	D	Solution Architect, Advisor	Analyze needs, ambitions and rational for cloud migration, finding good value proposals for prospects	7 in current company	ERP and finance systems	Norwegian cloud service provider
5	E	Chief Executive Officer	Undisclosed	16 in current company	Human capital management	Finnish SaaS provider
6	F	Head of Cloud Advisory and Technology Consulting	Heading a practice part of digital Consulting with over 100 consultants doing cloud migration, help customers in solution advisory	10 in current company	Technology	Finnish digital services and software company
7	G	Chief Technology Officer	Lead architecture team, staying up to date on technology and development, run projects, talk to customer, sell Basefarm as a company and build trust	11 in current company	Technology	European managed service provider
8	H	Chief Information Officer	Responsible for all IT systems and service desks, internal support, deployment and replacement of hardware and assets , development of new localised services	Undisclosed	Technology	International technology consultancy firm
9	I	Tribe Lead for Public Cloud Services, Squad leader for discovery team, Product Lead for Cloud Readiness Assessment	Gathering documentation, manage products and product owner within Public cloud division, information discovery for cloud transformation projects, developing frameworks	11 in current company	Technology	Finnish cloud hosting provider

The appropriate methodology enabled gathering extensive rich deep data for the study. Reported findings are presented in the following chapter.

## 4. Findings

This chapter seeks to present the most significant results from the study. It is organized into two parts. The first reports on critical success factors, mainly clarifying the notion of readiness, competence, transaction cost, and technology. The second will illustrate the benefits of using cloud computing divided into strategic, organizational, technological, and economic perspectives. Both chapters follow a certain natural flow by presenting themes backed up by reported findings related to four critical success factors that together create synergies reported in the benefit chapter. The goal is not to extrapolate but merely to delineate findings relevant to the research questions:

*What are critical success factors when organizations are transitioning to the cloud?*

*What are significant benefits when organizations are transitioning to the cloud?*

The reporting will serve as a foundation for the discussion chapter.

The following table presents an overview of the codes emerging from the data. Principal codes figure under the column "name," with the respective evoked subjects in the column "description." The column "files" describes how many interviewees expressed themselves on the principal codes. The column "reference" presents how often the main groups occurred across the data. Patterns emerged from the coding. The questions in the interview guide, attached in the appendix, inspired the coding process. Broad themes were well suited as overarching categories for coding.

Many sub-nodes emerged in the coding process, but the preceding table is a suitable overview.

The theme "benefit" seemed ideal as a category to assemble all the gains usage of cloud computing entailed. These gains related directly to the second research question.

The "challenges" category was separated to gain more in-depth knowledge about the caveats of cloud computing usage. Eventually, it was helpful to incorporate this theme into the data analysis as a critical success factor.

The theme "cloud paradigm" encompassed all information about cloud computing not directly fitting into the other categories, nonetheless supplementing the study.

The theme "critical success factors" related directly to the first research questions. This code eventually merged with the "challenge" category to devise a complete overview of the most critical success factors.

Table 2-1 Codes

Name	Description	Files	References
Benefits of cloud	Economic, organizational, strategic, technological, and customer gains, comparison with traditional IT systems, cloud success examples	9	71
Challenges	Legacy systems, lack of expertise, security, transaction costs, customer failure examples	9	70
Cloud paradigm	History, anecdotes, connotations, misconceptions, customer perceptions, vendors, cloud economics, future of cloud	8	66
Critical success factors	Competence, consultancy, auditing, cultural change, governance, motivation, optimization, readiness, strategic alignment, modernization of IT	9	54

We now proceed to report the findings.

## 4.1. Critical Success Factors

Strategically understanding the importance of success factors is beneficial for both a Cloud Service Provider and Cloud Service Customer (CSC). It enables improved assessment and selection of a compatible relationship partner. However, anticipating future prerequisites for competitive advantage and employee propensity to adopt a rigid mindset towards novel technology are considerable challenges. Empirical studies revealed the time to market, IT service cost, financial losses, quality of service, competitive pressure, and transaction cost to be critical success factors of CC adoption (Sharma, Gupta, Acharya, 2020).

It, therefore, seemed reasonable to structure the first part of the analysis on what critical success factors the interviewees emphasized. Four significant determinants emerged: Readiness, competence, transaction costs, and technology.

### 4.1.1. Readiness

There was a striking consensus about the importance of organizations grasping their motivations for opting for cloud solutions, making sure business needs match the cloud-sourced solution, being aware of the caveats presented by buzzwords, and having a proper strategy in place. The notions of business, culture, cloud technology readiness constitute the following chapter.

#### **Business readiness**

Organizations needed to understand their business correctly, distance themselves from hyped-up trends, face the reality of understanding what business problems were solved by going cloud and the organization's challenges. Grasping the rationale of own organizations existence and the relationship to the market seemed important to satisfy an initial readiness phase:

*"You need a cloud strategy before you try to enter it. Otherwise, you will probably mess up, use incorrect and possibly expensive components in the cloud, which are overwhelmingly complicated, and your workloads will be complicated as well. So if you don't have an opinion on that, you should try to evolve your processes, teams, and understanding of what your organization delivers. This is important before even considering entering the cloud because it would be expensive if you do it the wrong way." (Interviewee H)*

Knowledge of the business entailed increased knowledge of cloud components. Also, several interviewees emphasized recognition of the motivation to cloud source to be decisive:

*"Companies that decide to go cloud must ask themselves why they are going cloud? What are they trying to solve by going cloud? It always comes back to that, whether it's in the public or private sector, cloud or no cloud. What is going to be the impact? How is it going to help the business grow and reach its goals?" (Interviewee B)*

*"It's more a matter of why you move into the cloud. What is your motivation? In my experience, moving into a cloud-based solution is less painful than doing anything else. Because what you are doing when you merge into a cloud system, it's more or less jumping on a train that is already moving. It already has 100.000 users and companies operating on it, so we know it is working. You do more or less configure it for each customer or each user. You're running a configuration of something that is already running, which is a lot less risky than starting from scratch." (Interviewee D)*

*"You need a proper plan, and that plan is not necessarily technical. First of all, why are we going to the cloud? Is it lower prices, higher pace, better redundancy, or better control? It all has tradeoffs. If you want a lower price, you should find someone who has specialized in that sort of thing. If you want a higher pace, you probably want something with services and infrastructure to have autonomous teams that work by themselves using a common set of tooling. If you want better redundancy, you need to plan for it when you start building, so you don't end up routing traffic through a single point of failure or have dependencies. If you want better control, find a managed service provider to help you. You need to figure out what you want to achieve." (Interviewee G)*

Interviewee C complemented the argument of running through a single point of failure by illustrating a Hotel chain customer with guests unable to check out during system deficiency.

With business understanding and motivation in check, it was time to materialize through a concrete action plan and digitalization strategy:

*"You need to know where to start, where to go, and what to achieve with this? Are you moving legacy, or are you just starting from scratch and throwing out whatever you have laying around already. That is a viable strategy, but you need to decide on that strategy before jumping into it. Let's use Finn.no as an example; they are doing 500-700 deployments a week. So that is a high pace, but without a proper plan, they would lose control." (Interviewee G)*

*"Readiness is critical because you need to figure out how technology translates into a digitalization strategy by helping to reach company vision, goals, and strategies. Once you have a digitalization strategy, you have identified specific technologies to help you. If you don't do your readiness assessment and blindly go into ordering many things, hiring many people, starting many projects, sign a blank sheet, and give it to a consultancy company to do stuff for you, sure it might end up okay in the end, but that is in my experience where most of the problems happen. It is easy to go in the wrong direction. You can easily implement the wrong solutions, have security breaches and weaknesses in your setup. If you don't have a plan, there is bound to be a waste of time, manhours, money, and efficiency, so get that plan!"*  
(Interviewee I)

The affirmation consisted of having a clear plan to materialize the needs and actions of the organizations towards a unified goal while maintaining control over resources not to derail, which is the function of a strategy. People constitute organizations. Thus, for it to change, the people must adjust and adapt.

### **Culture readiness**

Another recurring theme was how organizations should be aware of certain aspects to fulfill the second level of readiness, cultural readiness. An interesting saying was about understanding IT's role in organizations. Cloud was for IT, but IT increasingly engrained itself in business as usual:

*"Traditional challenge is that it was something new, so you had to convince the market, customer, by customer that this was a better way to do it. Maybe I have forgotten all the pain, but typically HR people have zero interest in technology, so they focus on people and value. Servers, database systems, who cares? They have the IT department to take care of that and support them. HR departments are typically not used to buying software. So if it's the first time, you are a bit afraid. What's the right choice? It's a big decision for the organization since everybody will use the system, everybody will have an opinion. At the same time, everybody knows who decided on it, so that you can see the pressure as an HR director." (Interviewee E)*

*"Regarding the communication on the CXO level, executives will see that the CIO is more available and understands more about the business, so the CIO has to be more business-oriented, which is a benefit for the organization, but it's one big change because in legacy companies or in companies that have not been paying attention, executives will still see both security and IT as just one business unit that runs some stuff and they don't understand that if IT were a part of the business, it would enable the business to optimize more. And that is a cultural change." (Interviewee H)*

IT changed its function over the years, which other parts of the organizations could find challenging. Organizations saw a new trend emerging amid daily operations. Organizational inertia came up as an alternative explanation:

*"One hurdle is understanding how it impacts the users of the company and if you have an organizational challenge because some people don't like change. Many people don't like change. Even the customers. If you are making changes that impact your customers, you have to analyze that impact. Is it going to be good for you, or is it dangerous? That's the cultural aspect of it." (Interviewee I)*

Another connected explanation was the need for adaptation towards novel business practices as standardization characterized cloud solution platforms :

*"Companies need to acknowledge that they must be prepared to change their ways of doing things and processes because they will change. Cloud systems are more or less standard. You cannot get your own coding done. You have to stick with the functionality that is there. you can configure it, but you cannot really change it, which is a bit of a shock for some. That's how the system is designed, so you have to force them into standardized processes. So they need an organizational change to adapt to those changes. It's rarely a big problem, but they need to get their people on board and adopting this different mindset. Once that is done, they are better off." (Interviewee D)*

This transformational change into the cloud necessitated acclimatization but also engagement across all layers of the organization and future time orientation to appease cultural readiness:

*"Changing from on-premise to cloud is a change, and change is typically a bit scary. You have your infrastructure and your talented people taking care of it. Then comes the transition to the cloud. You might not need that team anymore in the future or require different skillsets. Change management requires a lot of leadership and an open mindset and not just thinking about where we are today and what we are good at but also about the future approach. Taking the step might be a huge thing internally for the organizational culture. So what is my role in the future? Can we do it? What is my input? Do I try to avoid it, or am I in? Can you really go through each stage? Can you motivate everybody? Get the commitment?" (Interviewee E)*

Interviewee B affirmed these factors about cultural impact, was part of an inevitable organizational change:

*"There is a big cultural change for companies, and that can be a disadvantage. It can take some time, resources, and headaches to get there, but I don't think they have a choice to be honest." (Interviewee B)*

The last section of readiness emerged from arguments related to understanding the implications of the cloud itself.

### **Cloud readiness**

Interviewee G expressed an interesting declaration regarding the specifics of business processes relevant for going cloud, which were documentation and indexing own stock before jumping on the cloud train:

*"If you are a typical enterprise IT and you have many consultants visiting and setting up applications, you have joined leaves, consultants hired for a short period, then documentation is not necessarily the highest priority or anyone's priority, to be honest. When you move to a managed service provider, at least a proper one, you are forced to document it because that is how we maintain insight, make sure things are running, and handle incidents. If you don't have that and throw it into the cloud, it won't be any better. You would have the same security mess, the same lack of overview. You will have a platform that enables you to spin up things way faster, so you create a way bigger mess. Start an inventory project, don't just move everything to the cloud and keep the timeframe realistic. I have been in meetings with*

*people saying they wanted to move huge portfolios into the cloud within three months, and it doesn't happen. It is possible, but it comes with tradeoffs that you would have to accept for a very long time. "(Interviewee G)*

Another interviewee confirmed this notion of formalizing processes, assuming control of the business, and described it as governance:

*"Governance means having things under control, knowing whom to call when things go wrong, documenting all the deployments, and knowing how all the things are today. " (Interviewee I)*

Another interesting finding revealed the need to alleviate the discrepancy between glorified unique selling point pitches and to understand the reality of what cloud is:

*"It's more like moving into an apartment that is already there and just furnishing and painting it with the colors you want instead of building a house from scratch." (Interviewee D)*

*"Removing yourself from the buzzword cloud or from the sales pitches to understand what it is and how to utilize the different building blocks. The different providers have different approaches to these components, but they are basically the same. Using these components correctly is essential; otherwise, you will fail, costly-wise, security-wise, and probably disabling you from optimizing your services. You might say the cloud was slower than on-prem systems, and that is probably because you have misconfigured something." (Interviewee H)*

*"When analysts of Gartner had conversations with customers, this question popped up. What should we do with the cloud? And the customer said, we can save cost by going cloud; the analysts were a bit skeptical about that and said, yes, you can maybe save some cost by going cloud, but that is not going to be the number one driver for going into the cloud." (Interviewee B)*

*"They typically always end up with big surprises because the cost of Azure and Public cloud is very different. You pay for everything." (Interviewee A)*

The hype evolving since 2010 seemed to have persuaded organizations that the cloud is the ultimate cost savior for anyone to use. Still, there was consensus to eradicate this idea. Furthermore, another interesting and somewhat unfortunate finding suggested some cloud solutions that, in its essence, were merely traditional IT infrastructure disguised as a cloud:

*"That is somewhat annoying. We arrive as a pure cloud provider with multi-tenant architecture and modern software. You have a competitor who says the same things with the same words. They might copy it from your website stating they are cloud tech. How do you explain that to customers? You have lost the game if you start to explain that kind of stuff to an HR director. There is no standard for what cloud means, such as different layers of multi-tenancy and the different benefits. But eventually, fake clouds are not getting the benefit of being a cloud system. For us, one investment covers*

*all the customers; for them, it's one by one. So we are continuously renewing the software, pushing releases for our clients, and they cannot keep up anymore.” (Interviewee E)*

*They build top layers on old technology. It looks like a cloud because they can access it through the web, but it's not born in the cloud. We use the expression born in the cloud. The technology will be very different if you design this from the beginning or build a user interface on top of something old. A multi-tenant public cloud is a real cloud. That means everyone shares and accesses the database in the same way. A lot of these systems are actually single-tenant private clouds. It's very different from a user or customer perspective because you still need to pay for every single upgrade, you and only you, whereas the multi-tenant cloud-like we do is for everyone. Once we release it, it's there like Facebook changes. It's the same thing. (Interviewee D)*

Despite these comments about opportunistic behavior in the market, it seemed reassuring that their technology would eventually expose players engaging with this. They would not keep up with legitimate cloud market players and the advantages they provide.

The second critical success factor that emerged from the analysis was competence explicated through management and expertise.

#### 4.1.2. Competence

Critical success factors in relationships between clients and multiple providers are operational collaboration, precise goal setting, trust, and cultural distance assessment. Governance mechanisms seem to remedy friction, enabling ITO success (Könning, Westner, Strahringer, 2019). CC outsourcing platforms provide industry advantages through skilled human resources (Akbar, Khan, Mahmood, Alsanad, Gumai, 2020). It was interesting to see what other factors surfaced compared to the literature and the relation to the argument above of skilled human resources.

The first noteworthy construct regarded management and its influence on organizations transitioning to the cloud. The tone at the top steers the people by cascading direction, objectives, and goals:

*“I have heard many times the word embedding with regards to the cloud. It means that you need the decision the move to the cloud from the top down. CEOs and decision-makers need to be fully active in deciding to move to the cloud.” (Interviewee C)*

Another finding complemented this and bridged with culture readiness:

*“IT is not a key player anymore. It's is about management. It all starts at the top. Management is moving to adjust them, and normally the organization will do it. Although you tend to get stuck with certain older employees, that might be difficult to change. They have been working like this for 20 years and not in hell if they are ever going to change. You do run into those, but it's mostly painless.” (Interviewee D)*

Interviewees underlined the development of the IT organization with specific regards towards CIOs and IT managers. A clear shift from traditional IT technical roles towards IT-business hybrids:

*“People in IT need to change their skillsets. They used to be servers, storage, network, and the security guys, but those roles are fading rapidly” (Interviewee I)*

*“We have learned the hard way that if we don’t involve the CIO or IT leaders in the conversation at some point, sometimes it stalls the sales process. I think the role of the CIO is to connect business challenges or objectives with technology. He or she needs to understand the business, where it is heading, what’s stopping them from realizing their goals, and what they need on the technology side to move forward. If they have a good understanding of the business, what they are looking to achieve, and how technology can enable it, that is the dream CIO for most companies. They need to be able to sit at the table with top leaders and have a say in key business decisions. I think that is going to be absolutely key.” (Interviewee B)*

*“The role of the CIO has completely changed. The old CIO is dead. He used to take care of the networks, servers, laptops and responsible for running the systems. The modern CIO needs to be extremely business-oriented and on top of what kind of systems we can use to gain strategic advantage. It needs to be a person with a combination of business acumen and insights. Someone on top of trends. It’s not a technology person anymore. It is more a business person with interest in technology.” (Interviewee D)*

However, a nuanced assertion revealed the complexity of the CIO’s role when grasping the different areas of cloud computing and their disparate significance:

*“A lot of CIO’s today will have grasped the major challenges, benefits, and threats of cloud computing without understanding the ramifications or details of certain things. But it’s tough to have full control. The only way to get control and understand is to have a team of people who go down the line to understand the different areas. The CIO can’t have all that knowledge, nor is it the profile. Technical people won’t usually become CIO’s, so the CIO’s role is to listen to the company’s challenges and set a strategy to address those challenges. Instead of having a top-down strategy setting culture as a CIO, you need to have your ear to the ground sort of strategy.” (Interviewee I)*

This finding sheds light on the need for organizations to possess knowledgeable teams when dealing with cloud technology. It addresses the importance of internal expertise, which is the subsequent key finding.

### **Internal expertise**

One crucial finding corroborated among all interviewees was the emphasis on knowing the platform organizations transition to:

*“The biggest drawback is not having the necessary expertise and underestimating the pitfalls, not thinking about governance, cost control, and control over the data before moving it out or doing a major change.” (Interviewee A)*

Thus, entailing appropriate expertise in-house to mitigate liabilities:

*“Get the proper knowledge in place. Operating in the cloud is a bit different than on the ground. Suddenly you don’t have that cable you can plug in if you mess up. A lot of these cloud services have many options, and you need to know what options to turn on and off. A good example is Amazon S3, an object store that can share your entire bucket with the world over the Internet. It’s a flag you set. If you switch it, everyone has access to everything. There have been many incidents with that sort of problem either because people don’t know any better or didn’t know what the bucket was used for and repurpose it for something else or switch it and forgot to turn it back on. There have been so many incidents that Amazon is actually scanning their infrastructure and warning you in case open buckets that aren’t specifically configured to be opened. So you need to know the platform you are going to.” (Interviewee G)*

Acquiring knowledge of the cloud necessitated to unearth the right people, but also enabled organizations to focus on their core strengths:

*“Find and hire the right people. Then, there are certain competencies you don’t need to build up internally, and again you can focus your efforts on what you’re good at.” (Interviewee B)*

Furthermore, the insource outsource ratio of competence seemed more complicated than traditional ITO decisions. An interesting revelation was the scarcity of knowledge in the market:

*“It boils down to what sort of competence you have. Are you going to do it all on your own? If you have a very enthusiastic team about a certain platform and no one knows any of the others, you should be careful going against that because getting people is hard. Getting excellent cloud people today is almost impossible in the Nordics. It is not impossible if you can pay millions, but that is not what a managed service provider can do, right? There has to be some financial sanity in the game. So what sort of competence do you have, or what sort of competence can you get your hands on that is reasonably stable?” (Interviewee G)*

Interview G affirmed that internal expertise was critical and exemplified through some organizations in the Norwegian Public sector, such as Skatteetaten and NAV, that considered retaining specific amounts of internal competence advantageous for improved control, speed, and quality services. Besides, they worked unbiasedly for the company the agenda.

Moreover, the knowledge complexity of the cloud revealed itself through the need to have groups of knowledgeable workers while underlining the challenge to amass particular insight:

*“The biggest challenge is how complex and broad cloud computing topics are. It’s almost impossible to be that person who has knowledge about all solutions and all technologies. If you want a good understanding of cloud computing, you are forced to have several people sharing their knowledge to get the full picture. You probably need to have an excellent technical head to understand cloud computing technologies truly, so that means that not everybody is fit to become a cloud engineer.”(Interviewee I)*

*“If you want to be fully operational and secure on-prem, you need to build much competence in your people, spend a lot of resources and many headcounts. One person cannot be storage, backup, active directory, security, and network specialist all at once. So you need the specialist in-house to operate this because it is no longer good enough to have broad infrastructure competence. You need to be a specialist within lots of areas, and that requires more than one person.” (Interviewee F)*

The intricacies of the cloud also came to light and naturally revealed the alternative of outsourcing cloud competence.

### **External expertise**

Interviewee C suggested the appropriate consultancy skills could be a source of competitive advantage:

*“The important part is finding consultants skilled enough to help you figure out your needs and realize solutions that are better than the competition.” (Interviewee C)*

A nuance revealed the importance of understanding the type of cloud solution organizations transition to and a acquire advisory accordingly to prosper in the cloud journey:

*“Moving into a SaaS application like Office 365 or Salesforce is different because then you know what you're getting, but when you start moving servers, workloads or applications that you have been developing internally to public cloud infrastructure, you can end up with many issues if you don't have control over cost, what you need and outstanding governance. Have the correct partner or the best possible people in-house when you do it, and of course, if you have an internal IT department that is very good at daily operations, you should bring in external expertise to get the best possible advice on your cloud journey at least for planning, and then you can execute yourself. Bring in the right skills; then you will succeed.” (Interviewee A)*

However, many interviewees iterated that locating qualified professionals was a challenging endeavor:

*“Finding experts and hiring experts is really difficult.” (Interviewee B)*

*“The biggest challenge is the lack of competence in the market. IT people who are very skilled got there by hands-on work, and right now, they are overworked, they don't have time to learn new things or teach anybody their knowledge, and you cannot school people to their level. If academia were to understand the need there is for these type of people, and instead of focusing just on the theoretical part of cloud computing, but actually applying it in an enterprise way, via the trainee aspect of it, and make it easier to have this as a career path, we could breed more cloud engineers and make this a happy story. The black box of innovation cannot be solved through lack of capacity.” (Interviewee I)*

*“There are not enough heads in Norway to serve this market.” (Interviewee F)*

Whether this condition is related to Norway, Scandinavia, or the global market, is subject to scrutiny. Nonetheless, the affirmation is alarming. They induced the challenge of localizing highly qualified expertise, making it hard to retain knowledge internally.

Furthermore, findings suggested a dynamic between an organization's internal competence and the relationship with external parties. Specifically, accentuating the low technical level of competence of some organizations:

*“If you are working from home, you need a VPN that’s connecting to the office location and uses a secure way to access the cloud, so networking is a significant factor there. Most of our customers have no networking experience, so we have to set up VPN tunnels, log in to existing firewalls, and buy new hardware if it’s old and set it up.” (Interviewee C)*

Moreover, underlining IT capabilities to be crucial to handle cloud computing technology:

*“If you do it yourself, you need to ensure that you have the skills either yourself or with a partner that can help you. So there are pitfalls. It’s not as good as it says in the office lines. Everything can be mitigated, obviously, but you need to know what you’re doing.” (Interviewee A)*

External parties could serve as a source of learning for building IT capabilities:

*“When we sell our solutions, we always encourage our customers to learn more about our platform and its capabilities. To get the most benefits out of the solution, they need to invest time and effort, but then it’s not about infrastructure, administrating, or maintaining the solutions. It’s more about capabilities. What capabilities can we utilize to drive more value?” (Interviewee B)*

*“What we are doing is providing you with a best practice way of doing.” (Interviewee D)*

Thus, organizations could exploit external party’s knowledge and incorporate them into organizational processes. Therefore, being able to optimize is the following presented finding.

Interviewees expressed the influential role of optimization to flourish with cloud computing solutions. This entailed financial optimization, tracing a parallel to commitment as part of cultural readiness:

*“You need commitment from all layers. You can’t have the CFO blocking the whole thing, saying it is way too expensive after the second month. Usually, first, you build, then you optimize. Financial optimization must be part of the project to ensure that you get value. We have seen people doing runaway stuff. You turn on something on Friday, and on Monday, your bill is about 150.000,- Which is straight up possible unless you put limits to your account or proper monitoring. But you need commitment because, during the transition phase, the cost will go up for certain. You will have two systems running, and that requires a certain commitment. Turning back midway is a bad idea. It will be a mess.” (Interviewee G)*

But also optimization of the cloud solution organizations decided to use to mitigate obsolescence:

*“If you establish the readiness part, done an analysis, weighing your pros and cons, perform your transformation. Once you have done your transformation, gain governance over your environment. Because just as in on-premise environments, cloud environments need maintenance and monitoring. You need to know how to set things up the way you want. You need to continuously survey the market, industry, and the new features that come around to not work on an obsolete platform. Or if there are vulnerabilities, you catch them. If there is optimization, keep an eye out for improvements so you can keep optimizing your platform because some things can have a life span of just a year or two in cloud computing. If you based your environment on something that only has a year or two in life-size, you would have some challenges.” (Interviewee I)*

An interesting finding that might not figure in the literature emerged as what I defined as the cloud loop of success to derive advantages from cloud solutions critically:

*“So those are the steps, readiness, governance, and continuous optimization, even after you have moved to the cloud. Maybe you have just moved some servers into the cloud. Many people are doing what we call «left in ship,» so you take your servers, move them to the cloud, and gain some freedom when it comes to infrastructure. But that is just moving servers to another place. You haven't done anything agile with your workloads or systems. So you need to consider this readiness part continuously. Let's say you've done the first bit. You're in the cloud and have done some automation. Now you want to take advantage of bleeding-edge technology. Then you need to redo the readiness phase, assess the next stage, costs, resources, and the technology. Once you have done that analysis, weighed the pros and cons, and it's worth it, you transform your workload and govern it. Then you make sure to optimize. It's an endless cycle.” (Interviewee I)*

Moreover, this idea was complemented with another compelling notion of a 360-degree view of the organization, boosting knowledge sharing and collaboration across departments and optimize the organization:

*“Everybody talks about the customer journey and customer 360. It means you have marketing, sales, and customer service departments. They all touch on the customer, and the customer does not care whom they are talking to. They see your brand. Many organizations are trying to figure out how to work better together internally. Many companies are siloed today. Marketing doesn't work very well with sales; sales don't really talk to the Marketing and Sales don't really cooperate with customer service guys, and I think that is where many companies are losing much money.” (Interviewee B)*

The last finding relating to the competence section pertained to the development of the cloud industry itself. Assuming organizations possessed this knowledge, it would be helpful to incorporate it into the competence equation to go cloud and choose the appropriate solution.

## Industry expertise

Findings revealed the exponential growth of the cloud industry, which was far from reaching market saturation, incentivizing organizations to transition into the cloud:

*“We are continuously fixing problems by using technology. Cloud is a broad term, but the SaaS model with web-based interfaces, everything is going to move in that direction very strongly, and you see at least on the data center side, the shift from on-premise servers to servers in Azure or Amazon or Google, is also a transition which we have only scratched the surface. Today, most companies have servers at providers such as Cegal, Visolit, Intility, or TietoEvy. Eventually, Cegal and others will move data centers on behalf of the customers to Azure, Amazon, and Google. So I think the industry will continue to grow exponentially.” (Interviewee A)*

*“We are seeing that the largest companies, for example, Google, Facebook, and Microsoft are adopting new trends incredibly fast compared to many other companies.” (Interviewee H)*

Today’s IT organizations had an advantage that organizations could have incorporated in their strategic planning and business processes. Geographical or cultural disparities delineated differences in the ranking of industry players:

*“For Norway, we see that Microsoft has been the predominant provider of IT services for many years and is very good at maintaining that control over the Norwegian market. If you choose Microsoft, you can't miss that much. In the US, Amazon is the big one, so it makes more sense to choose them as there are a lot of skills available in the market if you do. We have a lot of volumes, so we have much automation on top of it and expertise in-house with big multi-disciplinary teams, and that's the same for any cloud provider in Norway, Cegal, Visolit, Intility. We all have pros and cons, I guess, expertise in different areas, so we are all fairly competitive. We will always buy hardware, and that's always the cheapest when you can buy or lease hardware, put it in Norwegian datacenters. We have cheap power in Norway, very cheap communication lines, good connectivity, so we are very competitive in the Norwegian cloud provider market.” (Interviewee A)*

The third critical success factor that emerged concerned the notion of the transaction cost. Specifically, what variables rose as influential when engaging in a relationship with an organization providing cloud computing technology.

### 4.1.3. Transaction cost

According to the literature, compatibility issues were the most significant challenge for successfully implementing cloud sourcing development projects, followed by hidden costs, intellectual property issues, lack of goal congruence, operation, and transaction risks (Akbar, Shameem, Mahmood, Alsanad; Gumei 2020). It was interesting to see what topics emerged when interviewees responded to questions related to this theme.

## Hidden costs

An overwhelming consensus arose concerning how easy organizations transitioning to the cloud could compile additional cost not necessarily specified ex-ante in an agreement when engaging with cloud technology:

*“Hidden costs depend on the solutions. One thing is paying for subscription software, but you also need to pay, not in all cases, but in terms of a complex CRM implementation. 99percent of customers need a technology partner to implement the technology. It also depends on the company. If there are invested in building more competency in these areas, they will rely less on a partner moving forward.” (Interviewee B)*

Lack of knowledge was also a reoccurring rationale for incremental cost piling up, tracing a parallel to the importance of competence:

*“They don't understand the power of the cloud and end up with cost overruns. Then, they learn the hard way. When you set up a server in Amazon or Google or Azure, they connect it back to the network, and it's all good. They have many security mechanisms on their own on-prem data centers, firewalls, and all the bells and whistles of the security software. Then, in the Public Cloud, they have an open connection to the Internet on the Google servers, so they have a back door to the Internet, and I think that is something that you see in many cases. The developers initially start playing with the cloud and initially don't control the cost, governance, or security. I know companies that deployed code that spun up expensive resources that they were unaware of to end up with a million kroner loss because they didn't control it.” (Interviewee A)*

Moreover, interviewee G emphasized auditing to facilitate cost control:

*“The main user or owner of the service should be responsible for the financial performance of that service. Ultimately it should be the one footing the bill, so either CEO, CIO, CFO, or the department manager, depending on how you set it up. But that is important to have in the plan. The user is responsible for auditing the bills. Don't think that auditing is a simple task. Netflix 5 years ago had 800 servers running through Hadoop to process their amazon bill. So they got some tooling, there are excellent third-party tooling out there, and there are partners as well.” (Interviewee G)*

The example above is a true testament to the gravity of not controlling cost and the usefulness of using third parties. The following sub-chapter dives into the notion of the vendor lock-in, an idea with nuanced findings.

## Vendor Lock-in

The lock-in effect is a widely discussed construct and probably often negatively connotated. With a cloud industry characterized by increasingly many providers and a market with many uncertainties, it seemed appropriate to dig into this transaction cost.

One interviewee recommended that organizations choose their poison in the jungle of potential partners.

Interviewee A astutely exemplified the lock-in effect by referencing a song by The Eagles:

*“It’s like the lyrics from the song Hotel California “you can check out any time you like, but you can never leave.” It’s not true, you can leave, but it will cost you a little extra. One thing companies talk about, which is not a good strategy, is operations between multiple clouds to get negotiation rights with multiple cloud providers and avoid vendor lock-in. Some customers talk about hybrid, where you have some in private and some in hybrid. Then you end up with many problems with egress/ingress cost and maybe a terrible user experience. So my suggestion, if you are not extremely big, is to choose your poison, so to speak, choose a provider and stick with them for three to five years and make sure you get many deals with training and expertise available.” (Interviewee A)*

Deciding on a vendor was complemented by the following claim to accept the lock-in unless one was aware of the caveats of doing so:

*“You have to accept the lock-in. If you are paranoid with an exit plan and don’t accept the lock-in, you need to accept that the financial savings will be way less. You will have to accept more responsibility on your own unless you find a partner that will take responsibility for everything you are doing. It’s possible, but not necessarily as simple as finding a managed service provider that provides something from their basement.” (Interviewee G)*

An interesting nuance was made from the provider's side concerning this by stating organizations alleviate this transaction cost by constructing their systems with application processing interfaces to enable customers to integrate with technologies of their choosing:

*“We always realize that the customer has made loads of investments in different solutions, and we respect that big time. When we approach a prospect, we don’t expect to kick out any solution they ever invested in and replace it with ours. That would be great, but it’s not realistic. So we have a very open platform enabling us to integrate with pretty much any other technology on the planet. It’s straightforward to integrate and pull data from different systems, depending on what you want to do. Most customers need to integrate with an ERP system, which is key, at least with their CRM. I think open APIs make it easier for customers to connect with different solutions.” (Interviewee B)*

Another interview suggested organizations code their infrastructure as a remedy for more freedom of choice:

*“One thing that could be useful is writing all your infrastructure as code. You probably heard of Terraform, where you can choose your resource provider in your scripts, and I have only used to deploy in Azure, but I have heard you can choose your provider and deploy the same code to Google, Amazon, or Alibaba.” (Interviewee C)*

A more technical finding showed that the lock-in effect is only produced at certain levels of the infrastructure as most technologies possess identical underlying infrastructure:

*“Intel’s x86 platform has been around for more than 35 years, and they are still there. As long as the X86 or X86-64 bits are standard, which is the main processor architecture on most data centers, you don’t have a vendor lock-in due to that situation. It’s only layers above the processor architecture that will impose vendor lock-in. The biggest*

*companies are trying to do a vendor lock because it is important to optimize their services. You would have to understand what your workload is before you consider the different clouds.” (Interviewee H)*

This saying also enlightened another aspect of the lock-in effect, a way for providers to optimize cloud solutions and gain advantages in the cloud, leading to another point which is to exploit the cloud infrastructure to reap gains:

*“If you want to maximize benefits, you need to accept the drawbacks. If you want to reap all the benefits of either Azure, Amazon, Google, or the other ones, you need to accept the lock-in. You will gain the most by using their native infrastructure rather than building everything yourself. You will gain the most if you adapt your services or build your products tailored for that platform.” (Interviewee G)*

This point revealed an objective and maybe context-dependent aspect of thinking about the vendor lock-in to enhance business processes in a long-term perspective instead of a chained-down consequence of buying a solution. The finding entailed a precondition for organizations to trust their counterparts. Thus, leading to the following discovery.

## **Trust**

Interviewees recommended organizations to trust in the technology and its caretakers:

*“It is hugely important that you can trust the technology and whoever takes care of it. Customer data or data is in the cloud, so you trust customer information with cloud technology. So you need to be able to trust that it's being taken care of very well and that the company has good security people to make sure it's safe.” (Interviewee B)*

Moreover, it was necessary to place confidence in the relationship with the vendor and acknowledge their capabilities :

*“You need to be sure that your information and system is well secured, that you have basic functionality, and someone to advise you. If customers come to us, I would say it is about showing our competence by bringing something to the table. What a customer is about to do once, we have done hundreds of times. We provide answers by using experiences to be more effective. Data integrity, systems availability is also key. You can have the most secure and reliable system in the world, but the more secure, the less available, so you need to weigh those against each other. You earn customer's trust by consistently showing you can deliver services and help in cloud migration. Everyone will experience security breaches or a failure in some way. It is naive to think otherwise, but how you handle them is crucial. Those are probably the best quality factors of a vendor or provider.” (Interviewee F)*

*“We tend to come in with older people like myself, grey hair or no hair but many years of experience. We speak the language of the customers. We understand their language and their needs because we have had these kinds of jobs ourselves. We know what we are doing and whom we are talking to. They understand that we are competent in helping them, and we gain their trust. We are selling them a solution to a problem, so we need to persuade them that we can professionally do that.” (Interviewee D)*

A nuanced finding associated trust to contextual dependent factors:

*“It has to do with the culture again. I think Norwegians have trust as a core value. Harald Heia has a show called “Sønn av Norge”. It’s not something I thought about much, but in one episode, he talks about how much we trust each other and trust the companies that operate in Norway. Perhaps some would say that we’re naïve, but I think there is a general trust in the providers. Of course, ISO standards also regulate secure, quality, operations.” (Interviewee A)*

Organizations confiding in their counterparts entails a specific loss of control, described in the following paragraph.

### **Loss of control**

An interesting finding was a history lesson to exemplify loss of control, which seemed helpful in disarming a perception of loss of control for organizations in the cloud:

*“If you compare to how electricity was delivered in the late 1800s, every major manufacturer or factory would have their own power source, their own generator based on coal to make power. Some knowledgeable people in the 1800s decided to build centralized power plants and deliver power by power lines. They also had a tough time persuading their customers that this was a better idea by making power more efficient and delivering more uptime on the power grid. They also met the same resistance. The factory would give up control of the power delivery and buy from someone else, which was very scary. Who has their own power plant anymore? Nobody.” (Interviewee D)*

Another subsequent finding from the same interviewee traced a parallel to organizational inertia by aligning loss of control with threatened authority:

*“We used to have a bit of a problem with IT organizations a few years back because this meant they lost control. They used to be in control of all the systems, and now suddenly, we were, and that challenged their authority.” (Interviewee D)*

However, another finding relativized this loss of control by invoking the exact opposite. One loses control over some aspects of the system but might gain “god mode “ access:

*“Typically, the first guy who gets access to the Amazon portal has full privileges to spin up any resources anywhere in the world, and then the next guy gets the same access and so on. So you end up with extreme control, which many companies do not understand.” (Interviewee A)*

Extensive access requires competence, which many organizations lack, reaffirming the importance of choosing the right solution and engaging the right provider.

### **Choosing the right provider**

The interviewees responded to how organizations knew how to choose the right provider for transitioning to the cloud. Relational governance emerged as necessary for cementing a long term relationship:

*“They should find a long-term partner that they believe in and trust, capable of entering into a relationship rather than supplier-vendor contract, where the provider also cares about the interest of the customer, understand what is going on, making sure they are on the same page. Selecting a partner is hard. There are a lot of providers out there. I would argue many people would be better off with teams when trying to get a partner rather than trying to do it themselves.”*  
(Interviewee G)

Many interviewees acknowledged the importance of attributing a quality stamp to the provider of choice by assessing accomplishments, proof of value, and project into the future:

*“Most cloud systems are fairly standardized, so you need a system that has the functionality that you are looking for because you are not going to be able to do much to it once you choose it. You should do a thorough job investigating that they provide what you need, and the best way of doing that is, first of all, to know what you need and want. What you think you want may not be what you actually need, but that is a different discussion that we always end up in. Once you find systems that cover your needs, you need to make sure they actually deliver in the future. You are probably and hopefully going to be with a service provider for a long time, so you should look into previous accomplishments, upcoming innovations, and the professionalism or the people of the organization.”* (Interviewee D)

*“Choose the vendor that shows how they can best solve the business problem and show real value, show and proves by building a business case. What is this going to mean? We’re looking to do x,y,z. What’s the impact of this? What is the expectation in terms of return on investment? Where are we going to see that return? How are you going to get there? Companies able to prove that, and have a proven track record with success from other customers, means you are in good hands.”* (Interviewee B)

*“In the past, we did not use the cloud infrastructure. We wanted to change service providers for hosting or infrastructure and avoid lock-in. It was quite a big decision to start to use the native cloud infrastructure of Azure. There are other similar platforms, such as Amazon and Google, and then it’s a bet. I would urge everyone who buys something not to only look at the service provider’s setup today but considering the winning player in the market. You don’t want to change the service provider. You want the system to continuously develop and be on top of the trend. Betting on the winning product. Then you never have to change the system again, and you get the benefit of staying ahead of your competitors.”* (Interviewee E)

These results affirmed the need for compatibility between two parties to ensure a fruitful and prosperous cloud relationship. Furthermore, it also denoted customers' desires, not necessarily coinciding with an optimal solution for the organization. An exciting finding assumed a good fit was more probable by increasing the quality of the relationship with the cloud technology provider.

Moreover, findings seemed to divulge a certain demystifying of the lock-in effect by affirming that customers probably had more freedom than anticipated. The underlying mechanisms regarding lack of knowledge and resources would be pulling strings:

*“The idea is that the customer owns its subscription and lets us in as administrators so we can host it for them, but the ownership is still theirs. So we could pack up and leave, and the customers would still own their environment. They would need to replace monitoring, supervising, and processes, people to call, optimization. The governance bit can be replaced by somebody else, themselves included. But that might not be the case for everybody. They might buy services from somebody who owns a subscription and is more locked in work. You could challenge the hosting partners on the openness of their services to see what level of freedom you get. There is always a slight element of lock-in because the more you depend on your hosting provider, the less competence you have yourself, so it’s always worthwhile to have a few leveled head people within the organization to understand what is going on and to make sense of the strategic decisions you make yourself, but also what the hosting provider is trying to do.” (Interviewee I)*

The argument traced a parallel to the effect of knowledge and how organizations may utilize that to engage in proper communication with their providers to alleviate concerns and solve problems. Another finding nuanced by affirming that organizations were free to move across cloud providers. The additional exit costs and choice of another actor was an incentive for the provider to strive for competitiveness:

*“That is also a gain of going to the cloud because you are not tied up to any specifics. You haven’t invested in a huge amount of expensive things that you have to use for the next ten years. You can say goodbye, switch and go somewhere else. Maybe you have to pay another half a million for another system, but that is not that bad. That is what you do, and that forces us to be on top.” (Interviewee D)*

Another finding added more information about the cost of exiting a contract. However, reassured the lock-in is a natural part of the process for providers wanting to acquire new customers:

*“For Norway at least, Microsoft has been the predominant provider of IT services for many years and are very good at maintaining control over the Norwegian market. If you choose Microsoft, you can’t miss that much. Most providers would like to lock you down for at least 12 months. Everybody has to make an investment to onboard new customers, and therefore end up with at least 12 months contracts. Also, you do have vendor lock-in terms of exit penalty. If you commit to Azure for three years which I know the best, then you’ll get around fifty percent discount. You have a lock-in because you have a three-year-old contract. Then after the three years, If you want to exit Azure, you have to pay the egress fees, which is when you take data out of the cloud.” (Interviewee A)*

The interviewees' responses illuminated transaction costs relevant to the organizations transitioning to the cloud and enlightened the more advantageous side of cementing a relationship with a partner. Moreover, there would be ulterior reasons hindering a sturdy cloud relationship. The last subchapter describes externalities, a viable transaction cost, that seemed to be present among the findings.

## **Externalities**

The results from several interviewees indicated regulatory constraints could impact the success of a cloud transition:

*“Some customers have compliance regulations requiring to have data stored in the same country you are working from, so that might be a reason for moving. Sometimes it’s just as easy as clicking a move button in Azure, but other times, you need to make sure before you move that everything is going to work the same way after effect.” (Interviewee C)*

*“In Norwegian Public Sector, there is a very detailed process around buying the expertise, and it is hard to know what to buy and how to buy, what you should ask for when you do not have the expertise yourself and how to ask. Stortinget, as we all know, was attacked, and when they buy services, they need to write up specific requirements. We have this budget and need to have this done by 2021. Then they are not in sync with the market. We, as a vendor, cannot go to the customers and say: You are asking for A, but what you really need is B. Some rules and regulations make it hard for the Public Sector to ask the right questions and ask for the right offer. I am not saying we should bypass them, but it’s tough to get around compared to the private sector, where you can go directly to a vendor, ask for advice during the bid phase and have a better dialogue with the vendor.” (Interviewee F)*

This finding also reiterated the discrepancy between the expectation of a solution and the appropriate fit for the organization. Moreover, national disparities might also influence the success of going cloud. A finding emphasized the superior position of the cloud industry in Norway, well-positioned and providing benefits to the country as a whole:

*“Moving to a cloud from a Norwegian vendor such Cegal or Visolit, among others, is much more controlled because we as a professional partner control the hardware aspects and the consumption of the public cloud side. So we will always buy hardware, and that’s always the cheapest when you can buy or lease hardware, put it in Norwegian data centers, we have cheap power in Norway, very cheap communication lines, good connectivity, so we are very competitive, I guess in Norwegian cloud provider market.” (Interviewee A)*

The last critical success factor concerned the construct of technology. Cloud computing had evolved for an extended period, a trend still valid to this day. The technology’s impact attracted organizations who wanted to employ the booming technology. Several preconditions were mentioned.

#### 4.1.4. Technology

Technology evolves continuously and induces impactful changes in enterprises' applications, forcing organizations to invest in novel technologies to compete in their respective industry under increasingly demanding conditions. Cloud computing is a new information service model exploiting existing information communication technology (ICT) facilities (Cengiz, Bakirtas, 2020). It seemed interesting to assess the interviewees' responses relevant in this category.

##### **Technical readiness and tradeoffs**

A finding suggested assessing the tradeoffs of going cloud by evaluating its IT infrastructure and materializing that into a strategy:

*“As far as I know, they are going for speed. It might be more expensive to do it themselves because their speed requires a hedge of much hardware, which is not necessarily cheap. If you have a very stable IT that has not changed and will not change for years and want total control of it, it’s not necessarily the best thing to let a single guy head it up from scratch. So it’s a tradeoff. Are you moving legacy and starting from scratch, or are you just starting from scratch and throw out whatever you have laying around already. That is a viable strategy, but you need to decide on that strategy before jumping into it.” (Interviewee G)*

Moreover, a suggestion was to gauge the function of technology and its relevance to business processes, again avoiding glorified sales pitches:

*“The idea is to identify how technology can help you reach your goals. Then you can dive down into the more specific and narrower parts. With a digitization strategy in place, you can assess the pros and cons of either building something new or changing what you already have. You get to understand the ramifications of your project, the cost, the value cost? Performance expectations? This analysis part of understanding the consequences of your desired actions is essential. Some things look nice in a marketing slide and won’t necessarily be true in real life.” (Interviewee I)*

A more technical finding suggested basic knowledge around organizational processes surrounding the technology use:

*“Then you need to the regular stuff like organizing access, login monitoring, keep stuff in control, how do you audit stuff. Are there regulatory requirements that you need to build in? How do you manage incident and security problems, keep that in the wraps, and who is responsible for what?” (Interviewee G)*

An interviewee reiterated the importance of the motivation to employ cloud technology and a plan for continuous operation of the solutions. Solely adopting a trend would be detrimental:

*“Companies need to think through what they want, their motivation and intention. Nothing is better in the cloud. It’s just another server unless you make use of the services that different providers provide. You need to know why and think through why. How are you going to run this? Operate it afterward? How are you going to secure your environment? That does not mean the cloud is more insecure. It’s probably the other way around. So these are critical issues to think through before you move. You should not take one service and throw it in the cloud.” (Interviewee F)*

As many organizations already possess IT infrastructure, it was revealed influential in upgrading systems and resources to keep up and secure a safe transition to the cloud.

### **Modernizing IT**

Findings indicated that moving to the cloud induced a revamping of traditional IT, including a reallocation of capabilities:

*“Moving an IT organization to the cloud requires you to modernize the IT organization because you most probably would have many operations and support experts whose main work will change. Moving to the cloud means you don’t have to manage your servers anymore. I have heard some DevOps experts comparing servers to farming. The servers are cows and the operators being farmers, so when you move all the cows to another barn, the farmer has to do other tasks. That is a very simplified term, but in essence, being aware that your farmers will change your workloads or even do different tasks. Perhaps they would be more specific on product management, service improvement and focusing more on those areas instead of replacing hard drives, doing patching and updates, securing, fire extinguishing basically.” (Interviewee H)*

The farm example intelligently materialized the transfer of resources to other areas beneficial to the organization. However, it implied a smooth system upgrade, as was not always the case:

*“We ask them why they haven’t upgraded to the latest version, and they say they it implies many customizations, that it’s going to take us massive consultancy hours, and a massive disruption to the business, so they postpone it. Then you could say they are missing out on the latest technology, but on the other side, there is a huge cost in time, effort, and resources to do the upgrade, and then it’s not ideal. Also, there could be security vulnerabilities, which cloud software solves. We deliver software to the customers in our case three times a year, and they don’t even notice. It doesn’t disrupt their customization, business processes, or servers.” (Interviewee B)*

This finding iterated the critical benefit of cloud solutions helping in rejuvenating IT organizations. The caveat presented itself with traditional IT systems, which is the following subchapter.

### **Legacy systems**

Several results agreed upon the fact that older IT systems impeded a smooth transition to the cloud by creating a technology lag:

*“They don’t have access to modern technology because they are stuck in old systems that do not deliver the same technology. Typical ERP systems used to be a major investment. You would go for a huge system that would cost millions to implement, and once you have done that, it takes a year to implement, and it is a pain. You don’t want to change it. Visma is a good example. So you’re stuck with it. What are you going to do? It will cost another million in consultants if you upgrade it, and it probably crashes. You are not able to follow the technological development.” (Interviewee D)*

*“IT organizations with no strategy of systems being supportive of the business needs or processes, are not able to enter to the cloud because they have not done the research and don’t understand what their organization delivers. They try to move the legacy workload onto the cloud, which is incredibly expensive because it is not optimized or secure. You move the old legacy configuration and the entire architecture onto another server. That is probably one reason many companies are afraid to enter the cloud because so many have walked this path and failed. So they fall down a rabbit hole and dig themselves down, disabling them to continue the journey where they need to deliver new and better IT services for the business.” (Interviewee H)*

The hindrance of not being able to access novel technology impacted business continuity. Complementing arguments stated the need to build for resiliency:

*“Microsoft, Google, or Amazon run optimization workloads. They move VM data centers. They are always doing workloads and changing workloads in their clouds because that is how they need to operate to be efficient. VM running in the cloud will continue to run but might be migrated from one data center in Ireland to the second one in Abu-Dhabi, so you might encounter 3-4 second of downtime, which is not measured, but a user will not be able to enter that webpage running on that VM. Many companies that move legacy to the cloud will eventually see that this will impose many problems. So what you should expect when building services in the cloud is to build a service which is resilient towards, not particularly data loss but connectivity.” (Interviewee H)*

*“It is a continuous journey, to be up to date, having dedicated people focusing on the infrastructure and making sure that we are exploiting available benefits. Not too early with the technology but never too late also. As a software company, we continuously rewrite existing software to be modern and don’t turn out to be a legacy system. Today, many legacy cloud systems are built as technology that is extremely difficult to maintain and develop further. We made the right bet and started rewriting the system early and optimizing it, ensuring we benefit from the modern infrastructure. That was related to the bet that Azure was the best platform for us in the next 3-5 years? They did their own internal development, and we started to use those new features in our infrastructure to make the system more scalable, faster, reliable, and secure.” (Interviewee E)*

A confirmatory argument suggested engaging in a continuous journey of rewriting software and adapting to the cloud infrastructure of choice to exploit all of its advantages. Thus, reminding of the importance of minimizing transaction costs by modulating the technology to the cloud infrastructure.

Interviewee I suggested exploiting the black box of innovation as a solution to the complex cloud journey:

*“The only way to make sense of it is to open the black box and make incremental steps. Incremental steps will always be the easiest way because you can always see the next layer of the onion. Peel off one layer. If you are a legacy system, then let’s modernize the infrastructure. That went ok. People know what they are doing. Our servers are no longer in the basement, everything is the same, but we are in the cloud, so that’s great. We peel off the next layer. We got some applications running some systems. They are not so cool. I have read some blogs, I have been to some forums, and they told me about some cool new things that I can use, so how do we get there? You can write your own code or get a new cloud-based solution, maybe an ERP system. Then you peel off another layer. The easiest way to not fail is to make the black box small so that you don’t have to make too big of a leap.” (Interviewee I)*

The findings described the cloud journey as an intricate process to engage with, necessitating an explicit precondition of the technology. Naturally, interviewees were confronted thoroughly with the question about security described in the last subchapter.

## Security

There was a consensus among the results that security was a critical part of the cloud journey. Shared responsibility forced both the user and the provider to mitigate security liabilities. This argument surged among most interviewees. Moving to the cloud was not a disclaimer for the user nor absolved them of accidents:

*“That is your responsibility in the cloud. There is no one to nag you to make sure that it’s in place. Up to you to set it up. As someone discovered a couple of weeks ago when a couple of data centers in France burned down. If you don’t know where your backup is located, you have a problem. This is something that my organization has been working on for the last twenty years. We don’t store backup in the same place as the datacenters because we know the whole data center can blow up, so we store it separately. We ensure that the backup is stored in a different setup because we are paranoid. We have tried all of this a couple of times. That knowledge is important to bring along on the cloud journey.”* (Interviewee G)

*“If you store data, you don’t store it once. You store it four times. You have one set of data, but you need to get that data immediately, so you mirror that data, so two sets of the same data live at any given time, but you need to back that up in case someone will bleed that data or corrupt it. If one set is corrupted, they are both corrupted. So you need two sets of data and a backup. If you are really paranoid, you may want to back up your backup, so you mirror your backup and mirror your data 4 times.”* (Interviewee I)

Again, knowledge about the technology was inherent to secure IT environments:

*“If you are using a partner like us, you want them to know something about security and help you recover files if something goes wrong.”* (Interviewee C)

*“You don’t get default security in the cloud. You get some added or better security because the components are better than on legacy systems. But to be secure both on-prem and in the cloud, you still need to understand the components you want to build to secure your systems. One misconception about the cloud is that it is less secure than classical IT systems. They are not at all. Most of the security issues that occur in companies are basically due to misconfiguration, so it is important to understand basics of security.”* (Interviewee H)

*“All public clouds use what they call a shared responsibility model or security model, so they are responsible for the security of the cloud, but you are responsible for what is in the cloud. They help you out with a few bits and pieces, but, in general, if you want to shoot yourself in the foot, they have the tools. They even have the cannon.”* (Interviewee G)

The cannon example clearly illustrated the severity of underestimating security in the cloud. More findings iterated to the advantage of cooperating, trusting one partner, preparing for the worst, and hoping for the best:

*“You are never safer than the weakest link, which is the end-user. When you are a SaaS, you put your service practically in your end-users fingertips. You will never be able to secure everything, and if you do, those kinds of expenses will make any company kneel. So we need to educate and help the weakest link as best as we can, but there will always be a way in. If someone forgets to lock the door, there will be a way in.” (Interviewee F)*

*“It’s usually tough for people to attack the infrastructure of the cloud environment. Maybe you haven’t even installed the simple things like your users need to login to your systems and have not got multifactor authentication. Password protection can easily be decrypted.” (Interviewee I)*

The findings indicated an urgency to commit to a minimum of knowledge and approach cloud security mindfully as it had critical implications for cloud technology. However, most interviewees emphasized the superior security measures of cloud providers, thus recommended organizations to admit to that and embrace it. Thus demystifying the misconception surrounding cloud security:

*“From a security perspective, all the big guys, they have the best security mines on the planet, and they will find and hire the best security people on the planet. They have two teams that work on security. One team is trying to hack the system constantly, and the other is trying to catch the teams hacking the system, and they are doing that 24/7. Very few companies can compete with that kind of competency. There is just no way, and it’s going to be tremendously expensive if they try to find that those people.” (Interviewee B)*

*“I might be naïve, but I am not concerned about the security aspect of it. I know some skeptics of American companies think it should be on Norwegian soil and that the public cloud is not secure. I think that the billions of dollars they throw into security, these guys are better than anybody.” (Interviewee A)*

Thus, it seemed that having a relationship with a partner with that amount of security measures was beneficial. Still, accidents would happen, inducing the need for mitigation:

*“It is usually a human error, and it’s not necessarily giving credentials away. It could just be, “We have this system, it’s not really important, but somebody gains access to it and through that system maybe give yourself more credentials and have access to things you should not have access to. This is stuff you don’t know unless you know, and you need to train to understand these things. Even security-trained people don’t know everything, so the only real way is to prepare for the day you get attacked.” (Interviewee I)*

*“And you can have security exercises periodically. I have seen companies say, hey, we will give you 20.000 dollars if you manage to hack us. Go right ahead. People will then hack them and say, Hey, I hacked you, found this loophole, great, and now you plug it. You can survey your security environment, go through your routines, set up processes for wiping out all the counts that should not exist anymore, and it goes back to knowing all these things and putting them into your governance.” (Interviewee I)*

The data analysis revealed critical success factors to revolve around organizational readiness, competence, awareness of transaction costs, and technology to succeed in transitioning to the cloud. The following chapter dives into the findings regarding the benefits successful cloud usage enables.

## 4.2. Benefits

The rich deep data enabled me to organize benefits into strategic, organizational, technological, and economic categories.

### 4.2.1. Strategic

An interesting finding concerned the complexity of discerning strategic benefits relevant to an organization seeking to be innovative:

*“In the market, we have many service providers, who have taken on the task of running customer infrastructure, IT infrastructure, so they are already buying compute as a service in a sense. Many of them don’t have to buy their own servers and manage. Many hosting providers are doing it for them. For this type of customer to go to the cloud, they will find that server for server ratio is not positive. There are no big savings in cash, but what you have are the strategic gains, and those are hard to quantify. So that is the biggest challenge. How do you quantify them? It’s the famous 70/30 percent of management in IT. You spend 70 percent of your time managing your IT and 30 percent on innovation. You want to flip that.” (Interviewee I)*

Nonetheless, several factors surfaced. An overall consensus presented itself around the fact that speed was a clear benefit of going cloud:

*“In general, for me, the cloud is speed. You can initiate an R&D project on Friday and have it up and running on Monday if you like rather than having people buy boxes, get someone to install it, get cables into it, make sure that everything is working together, and do testing. You just push a button and, or even better, write infrastructure as a code. So the main thing with the cloud is speed. You have to accept a few truths when going there, but mainly it is a huge enabler for business and technology to move forward.” (Interviewee G)*

*“The benefits of having standardized components and also certification in the cloud is that resources have a common language, toolchains, and processes to build the services that you would require. Doing that is basically having a standardized IT organization that is essential to deliver on the time frames that we are supposed to. Not during the Pandemic, but in general, IT needs to deliver faster and better to cope with the business.” (Interviewee H)*

The speed did not come without caveats but nonetheless empowered organizations to deliver improved services. Moreover, agility emerged as a significant advantage of the cloud:

*“Companies that jump into the cloud can change faster because they are not so set. If you’re investing in technology and running it in-house, you rely on building loads of competency on that technology, and if they leave, you need to find new people to cover that area. If it’s cloud technology, you still need to find competency, but you don’t need to worry about running it, and you have more flexibility to change faster. That’s important from a business perspective as business and customer needs are changing faster and faster all the time.” (Interviewee B)*

*“It enables companies to get global reach from the command line. So our team in Norway can deploy code from our desktop into a data center in Australia. It’s absolutely fantastic. We derail huge enterprise data centers from the command line. The power of that is immense and fantastic flexibility. If you look at the drivers of cloud, it’s the web interface that you can use and do anything from, such as me talking to you on Zoom from my car with outstanding quality.” (Interviewee A)*

This flexibility was specifically relevant in current times of the Pandemic, forcing organizations to reconfigure their business processes and adapt to the Force Majeure of the market. Furthermore, the majority of interviewees disclosed the construct of scalability:

*“Scalability is one critical factor. If you make use of as a service product from, for example, Microsoft and Azure, you will have much better services. You can make use of a database as a service, for example, operated from Microsoft. You have the security patches and basic infrastructure operated by the cloud provider. You still need to think about what you will run on top of the platform, but you most probably have a more secure and more effective platform. You can start up a service in a day and finish it off after a month if you don’t need it anymore. So the scalability both up and down is the one big success factor and the most important to think about when using the cloud.” (Interviewee F)*

*“If you are using a public cloud provider like Azure, you’ll have much more room regarding scaling, auto-scaling, hyper clustering, which allows scaling business on demand. Suppose you were serving customers in Norway and expanding to the entire Europe. In that case, you could set up existing features and connect them to whatever you have in the cloud in the portal with Powershell or Command interfaces and build on what you have. It’s a competitive advantage, but everyone can do it.” (Interviewee C)*

Speed, scalability, and agility surfaced as benefits of the cloud. Still, another finding was that organizations were able to focus on their core competency by outsourcing exhausting resource components to the cloud:

*“I think the cloud is an enabler for companies to spend more of their time and resources on what they are good at. You outsource the task of operating infrastructure, applications, and servers that you don’t need to run in-house. Unless it’s your core business, you should have excellent arguments about why you should not go into the cloud. If you can focus on core competency and spend less time on the hassle of maintaining, upgrading, and managing systems, you will be better off.” (Interviewee B)*

*“The essence of technology is that most new features and technologies come to cloud-first nowadays, so companies that focus on having everything on-premises are going to have to keep much focus on their IT environment have people trained, and spend much money in this area. So, the question is if that is in their interest? Is IT a core part of their business? If it’s not, the outsourcing bit is just a natural move. You don’t want to run servers in your basement.”*  
(Interviewee I)

Not running servers in the basement was a reoccurring theme during the interviews, as it would impede organizations to gain competitive advantage:

*“The strategic gains is that you are on top of the technology, which means competitors are not going to run away ahead of you because you are lagging behind.”* (Interviewee D)

*“Very easy to get stuff out there, test out to market theories, so that’s the primary opportunity around the cloud technology. Rapid innovation, become more competitive and create value to your customers and employees by doing digitalization.”* (Interviewee A)

*“You have a global presence, a massive amount of computing, storage, networking power that you could never hope to get. The innovation opportunities are much closer or easier to start. You can ramp up a thousand servers in a week and turn it right off, so you don’t have to make big investments. So the hurdle is much lower.”* (Interviewee I)

In addition to investment savings, organizations would benefit from the experience and resources of the providers, who applied best practices to deliver superior productization and technology experiences for customers:

*“Today, the cloud is a requirement. The benefits are the productization and the market getting more mature for the customer. We know what they really want. We see it from our existing clients what really creates value. Then, we take those best practices to our product development and the productization of services and processes. Customers benefit from the existing customer base and experience our experience about HR-tech.”* (Interviewee E)

These findings underline how value creation, innovation capabilities, and integrating cloud technology to fit business needs pave the way for an edge over competitors, as exemplified by the following example:

*“Netflix can fully vacate in 15 minutes a full region of Amazon, move all the clients to a different region, that’s counted in the millions. So they move, for example, from Ireland to New York without anybody noticing. It’s not science fiction. It’s structured work. They have taken that sort of approach and invested a huge amount of money in making sure that sort of thing works because that is crucial to their business.”* (Interviewee G)

Moreover, an exciting remark related to externalities such as the ongoing pandemic facilitating usage of cloud services as an advantage in times of crisis:

*“I guess Covid has accelerated that. Our main customers, the Oil and Gas companies, have geologists working with high-end 3D graphics. Even though we have been working from phones and laptops for years, working from home with high-end 3d graphics with acceptable performance has been a problem, so some of our clients have been using one of our geologists' offerings, geo-cloud. They have been pleased to send their workforce home and continue business as usual, finding oil and optimizing production. Services we produce have been proving its worth now more than ever.”* (Interviewee A)

*“For example, what is one on one discussion in Covid times? So that is something we can deliver to our clients with marketing, with best practice approaches in their system, so they don't have to invent those things by themselves. The key thing here is that it is not just paper, or hype, or a thing you just think about. It's a practical thing. There is an update. There is a best practice process, do it like this. Then integrate that practice and get benefits without spending much time thinking by yourself.”* (Interviewee E)

The findings valued many strategic benefits. I was also able to delineate benefits occurring at the organizational level.

#### 4.2.2. Organizational

An emerging opinion involved process improvements that enabled usability and ease of use of the solution:

*“Usability is the key feature. Our system and at least most cloud systems are designed so that you can securely access them anywhere in the world. Easy access increases the usage, which eventually creates transparency. Employees can access their data easily. We tend to forget things. When did I get the last salary raise? How many days of absence did I have last year? I haven't been sick in a year; oh yes, I was, there it is. Now I remember. It's not just transparency to others but also ourselves through easy access to records, data, and background.”* (Interviewee E)

*“First and foremost, it is an excellent tool. Suppose we define cloud by the big players, Amazon, Azure, Google, OVH, Hetzner, those sort of companies, and a few others. They bring a huge R&D organization and make sort of standardized products that you can pick as off as Lego bricks and build whatever you like, so they remove the hard part of IT, which is managing these devices, finding a place for them, making sure that they work, finding a place in the budget for CapEx investment.”* (Interviewee G)

Another key benefit was that usability enabled access to data relevant for decision making, collaboration across departments, knowledge sharing, and leaner business processes:

*“The cloud platform allows companies to have easier insight into data and information to do their job more effectively, and it doesn't matter where you work in the company. It's more and more important to have the same view to be more effective. If I have a meeting with one of my customers and a huge problem with the software, I should know about it before meeting with them. So before I go into the meeting, I can go straight into my cloud solutions and look for any support issues that I should know about before the meeting. It's that 360 views, and I think having cloud technology*

*makes that much easier than having it on-premise. You can also expand to external partners, bring in business partners into this view as well.” (Interviewee B)*

*“So one on one discussions, target setting, my achievements. We tend to forget those, but when it’s easily available, I know that my manager sees exactly the same data. We see the same agreements. It’s not signed in a formal clause, but it’s there. It’s the same text that we agreed upon together and wrote together. And then we can have a look at that.” (Interviewee E)*

The findings indicated a preponderance of cloud computing technology to facilitate data incorporation into organizational behavior. Specifically relevant for leadership:

*“It’s a tool for employees, managers, and a tool for leadership. It’s not dependent on the level in the hierarchy. Like one-on-one discussion, you will have it with your direct supervisor at all the layers in the organization. Let’s say you have a top team of 5-10 people, and that is your main task, having those conversations, making sure that everything is aligned. That is the responsibility and the core leadership area. We are providing a tool for that. What really adds value is the analytics part. The visibility and transparency to data. Typically the higher in the hierarchy, the more access you have to data.” (Interviewee E)*

Data analytics-enabled transparency and effectiveness. But also trickle into the ability to save resources:

*“So having proper one on one discussions or building better leadership in the organization with up-to-date modern tools, what is the value of that? If you can avoid one monthly leaver in the organization, that’s much money saved. Then measure that cost of employee turnover? Can you track the cause? What was the role of the system? Keeping the talent in the organization or, on the other hand, getting rid of the guys poisoning the environment.” (Interviewee E)*

Other Interviewees also confirmed saving resources a benefit of transitioning to the cloud:

*“If you have a group of 10 people hosting your own infrastructure and you give away maintenance of that infrastructure to somebody else, you might just need one or two coordinating with the hosting team. Then the rest of the eight can go somewhere else. And they often go to acquisition positions, look at new investments, developments of new services. Of course, if you are a big CXO person, you can lay some people off. So that is the sad reality of it.” (Interviewee I)*

*“Moving to a public cloud is fantastic. We don’t have to buy hardware, we pay for what we use, and anything inside the public cloud is software-defined so that we can use code instead of man labor to deploy and manage it.” (Interviewee A)*

Organizations would spare material resources and could monitor themselves more effectively. On the one hand, to track behavior and aid management decisions, reallocate capabilities. On the other hand, cutting down resources as a part of cost control or maintaining a healthy organizational culture. Moreover, cloud computing benefitted organization through the use of customer feedback to optimize services:

*“One thing I would like to add when it comes to cloud software is that we update the system continuously, so we take the feedback from our existing customer base and turn that into product development or best practice approach or advice to our customers in the form of content.” (Interviewee E)*

*“We have around 15.000 customers or companies using the system, which means we are collecting data from all of them and using it to teach the system what to do.” (Interviewee D)*

Organizations employing cloud technology provided data and information to their partners. The latter would extract, analyze, transform and relay it back to customers, thereby instigating an endless loop of value creation. The following subchapter revealed its own set of technological benefits among the data.

#### 4.2.3. Technological

One finding iterated by all interviewees was the ability to eliminate the acquisition of hardware:

*“If I were an IT manager somewhere, I would never buy hardware and build it in my data center. It is just like cleaning services or any commodity service. You buy it from companies who are experts in that field. Suppose you look at the SaaS vendors like Salesforce or Office 365 or Visma in Norway. In that case, it's everything in a web browser, works on any device, on any communication line, the list of advantages goes on and on. The SaaS business model is the holy grail that everyone wants to go to. You want to have web-based apps with bells and whistles of a SaaS type of setup.” (Interviewee A)*

Also, the benefit of systems upgrades and functionalities from using cloud computing emerged across several interviewees:

*“We do two or three major releases every year, and we do weekly patching of things, so you are always on top of the newest technology, and there is a high willingness to pay for that because what they are used to after they bought their old Visma system from 50 years ago, is that they are lagging behind further and further in technology. So they see this great opportunity of always having the new thing. It's like someone tells you, you are going to pay a little more, but you are going to get a new car every month.” (Interviewee D)*

*“They get new functionality, and of course we work closely with our partners to make sure they utilize the new functionality and get more value of it.” (Interviewee B)*

Cloud technology providers seemed to work extensively around continuously optimizing their solutions and providing enhanced services and experiences for their customers. Also, customers would profit from limited system failures and improved storage capacity:

*“I think we have an uptime of the system of 99,98 percent. It hardly ever goes down, and that is important. If that starts happening, then, of course, our customers are going to get pissed off and say we don’t want to deal with this shit anymore and go somewhere else.” (Interviewee D)*

*“Another major reason to move to the cloud is that companies see that it is a safe place to store the data. Internet connections are so good that there is virtually no downtime on the net. They also understand that cloud providers can provide a much more reliable application than if you put it in the servers of your basement. And it’s cost-efficient. You don’t have to invest in hardware and software.” (Interviewee D)*

The findings devised considerable technological advantages. Furthermore, I assembled the ideas surrounding the potential economic benefits of cloud computing usage, which is the final subchapter.

#### 4.2.4. Economic

Interesting findings emerged from the analysis, revealing somewhat agreement that economic benefits existed more subtly. As the various caveats of cloud computing could quickly endanger the financial aspect, organizational would need to maneuver the cloud with caution to reap economic benefits. One precondition was to adopt an action plan and comply with the rules of the game, tracing a parallel to readiness as critical to succeed:

*“If you do it right, commit, and adapt, you can reap the benefit of both speed and financial benefits at the same time. The cost will come into play as long as you play by their rules and the rules are different between the players. As long as you adhere to the rules, you can win and do the right things, but it requires investment.” (Interviewee G)*

Other perceptions evoked no inherent money savings unless knowledge about the cloud was present:

*“The cost is secondary. The cost is the cost, and that should be something that you think about after finding the correct place for your services. The focus should be on what kind of services you would like to run? How much computing power would you need? How fast would you like to enable new services? If you have a team that can do that with your localized services and has a bargaining agreement with a hardware vendor, that’s fine. Still, I know that Amazon, Microsoft, and Google, and now many other companies are competing for this information. They have a price strategy that is very particular and competitive. If you don’t have a clue about your utilization and haven’t optimized your services before entering the cloud, it will be costly.” (Interviewee H)*

*“Cloud is not necessarily the cheapest way. In the public cloud, you pay for flexibility to turn things on a Monday and off on a Tuesday. Some of these vendors are focused on products. They deliver a whole range of services that you can sign off on, more or less in microseconds, or seconds or minutes. Others are more focused on providing the experience of fewer products but way cheaper. So you get the basic product, IaaS or VM’s, very cheap. And you need to know that before you jump into it with both legs because you might sink to the bottom.” (Interviewee G)*

These affirmations were also somewhat nuanced about contextual factors that could reduce cost:

*“They are paying us a monthly fee to have servers up and running, but if you are using public azure, you can use the same time, and you will be paying by the hour. If you are a customer working 9-17, you can turn off the VM after 17 and having it spun up again before the workday starts, and that can help you save money in the long term.” (Interviewee C)*

*“The financial edge is there, but you really need to know what you are doing, and not just do a one-time audit when you set it up, but you need to revisit it at least every month. There are thousands of products released on Amazon every year. There are products and pricing updated almost every week. You can save 60percent straight up if you switch to AWS’s CPU architecture. If you’re running a web software written with a modern web language, you don’t have any problems, but in other cases, you have to rewrite your software to reap those benefits, but it’s 60percent.” (Interviewee G)*

*“The flipside to on-demand services is, for example, reserved instances, where you pay upfront or commit to paying for an instance for a very long time, three years, for example. So that can save you 60percent straight up, but again you need to know what you are doing.” (Interviewee G)*

However, a general tendency among the findings revealed cloud computing solutions being more expensive compared to traditional IT systems:

*“In cloud systems, you either pay by transaction volume or number of users. It’s generally very predictable because you pay a fixed price, and someone else keeps the system upgraded and running. So you know what you are going to pay. Whereas in the old days, the system would crash, you needed consultants to upgrade and all those unpredictable costs. Customers would mostly experience positive things with the cost structure. With that said, the cost can be higher by going to the cloud. The system can be costly compared to the license you used to pay for your old Visma system. We constantly see that when we start comparing and our prices are three times what they used to pay.” (Interviewee D)*

The surpassing costs emerged among one interviewee as an incentive for providers to mitigate cost liabilities and alleviate the negative publicity around cloud solutions incurring enormous costs:

*“A few of these cloud providers have figured out that all of these stories popping out stating that cloud is so expensive because we did X and here is the bill we got, doesn’t benefit them. So they have started reaching out to customers and telling them. “Hey, we see you have this usage pattern. Here is what you should do to lower your bills. They send those*

e-mails now, which is interesting. There is also data based on the fact that if you screw up once with the big players and rip a huge bill, they will reimburse you for that one time and say, "yeah, we know you played and screwed it up, fine don't do it again." (Interviewee G)

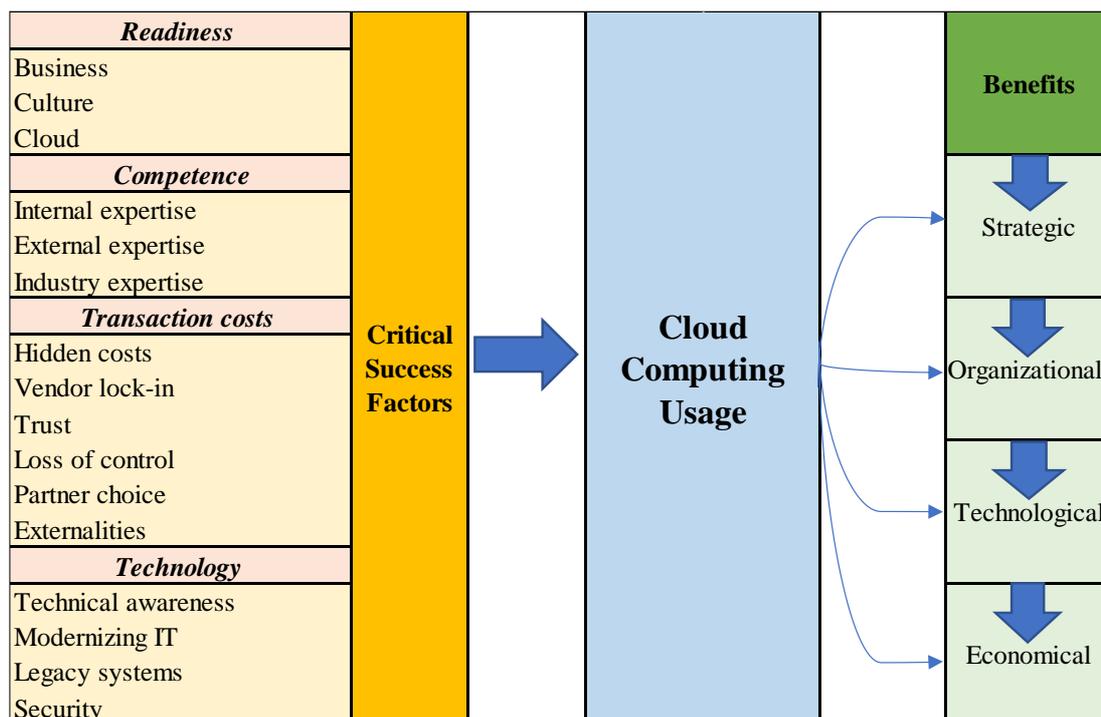
Moreover, the findings revealed organizations misconception of the price of using cloud computing technology:

"Some companies are very price-oriented. They have in mind that they need a new system, ERP, CRM, any system. They reach out to a bunch of vendors and say, "Hey, how much is it going to cost if we want to replace our CRM system?" That depends, right? How many people are you, what problem are you looking to solve? Are you looking to address sales, marketing, both? Service? I think many customers get hung up on the price in the beginning but then, not all customers, but most customers, later on, realize that it may not be as important as the impact of solving their business problems. If the return is great on solving them, price is irrelevant. Price is always going to be an important element obviously, but less important." (Interviewee B)

"It's a matter of what you are getting for the money. You can shrug away your old hardware. You can expect savings in other areas, such as on the people's side. We are assuming process improvements. That's is the world we are telling them they are coming into. You have four people doing manual tasks on a system, entering data. You don't have to do that anymore because the system has intelligence that can do it much better. In other words, you will save those four people or at least three of them, and that would rationalize it. It might still be a higher cost to it, so what we are saying to them is that yes, you are paying a higher cost, but you constantly stay on top of the technology." (Interviewee D)

The following table summarizes the findings:

Table 3-1 Summarized findings



As the findings show, organizations might have particular inclinations and perceptions that might be detrimental to their transition to the cloud. Therefore, the need to assess critical success factors to reap benefits is of high value. The next chapter seeks to discuss these findings.

## **5. Discussion**

This chapter seeks to synthesize results from the previous chapter, interpret the significance of the findings in light of conducted literature review and enlighten any additional insights deemed relevant to answer the research questions. The aim is to gain an in-depth understanding of the research problem, emphasize implications for organizations or individuals interested in this phenomenon, and shed light on future research areas. The chapter starts by reiterating the objective of this study. The first subchapter interprets the findings, followed by a conclusion to sum up the investigation, implications, and suggestions for future research.

The thesis aimed to investigate essential factors organizations should assess when employing cloud computing solutions and various benefits its utilization entails. The study has consistently been separated into critical success factors and benefits, focusing on the former. It was natural to integrate benefits into the study as it materialized the positive aspects of using cloud computing technology. Thus, seeking to answer the following related research questions:

***What are critical success factors when organizations are transitioning to the cloud?***

***What are significant benefits when organizations are transitioning to the cloud?***

The literature review delineated the theoretical foundation. Findings indicated organizational learning to be essential to capitalize on cloud computing solutions. It included motivation, commitment, talent management, organizational culture change, and management involvement. Furthermore, hidden costs occurred when realizing a cloud sourcing decision. Vendor lock-in specifically emerged as a primary concern for organizations in addition to uncertainty and security liabilities.

RBV, KM, TCE, and SDT were relevant to explain the transformational change of going cloud and its pitfalls. A holistic view of strategic business knowledge indicated the value of using these theoretical perspectives to answer the research questions.

Furthermore, the literature review revealed accessibility, connectivity, cost, scalability, ease of use, and usefulness as a competitive advantage for an organization.

The chapter will develop as follows. First, a personal interpretation of a finding, followed by its occurrence and relevance to extant theory and terminated by arguments from the literature discussed in light of theory and various interviewee answers. The goal is to explain surprising and unsurprising findings, eventual contradictions, and speculations.

This qualitative study revealed several critical success factors: Readiness, Competence, Transaction Costs, and Technology. These variables enabled a beneficial use of cloud computing solutions along strategic, organizational, technological, and economic dimensions. It was interesting to see how the findings in this study would align with the literature. The chapter advances in this order.

## **5.1. Critical success factors**

### **5.1.1. Readiness**

Findings related to readiness encompassed business, culture, and cloud readiness.

#### *5.1.1.1. Business*

##### **Understand the business**

A key argument centered around the importance for organizations to understand their business, what value proposition it delivers to the market, its position relative to competitors, and how that is compatible with cloud computing solutions. As the cloud computing paradigm is a broad area, its complexity varies. Thus understanding how the business relates to those multiple options becomes paramount. The company must be understood and then adapted to the appropriate cloud solutions and not the other way around. This idea might be counterintuitive for organizations, initially thinking they acquire a solution tailored to their current organization. Understanding the nature of own business, how it creates value both in the present and in the future, and relate that to the development of technology, is one of the cornerstones of cloud journey success. This finding was consistent with the literature iterating the necessity to assess business objectives before engaging with the cloud and derive benefits.

It is paramount for the organization to continuously assess business objectives in light of its IT and deploy novel IT investments (Jones, Irani, Sivarajah, Love, 2019). Cloud computing enables information sharing across the organization, but how that data exchange conforms with business objectives is variable. Common reasons for cloud failures pertain to integration deficiencies and precarious service orientation. Therefore organizations need to understand how to use cloud computing to optimize organizational processes that bring value to the firm (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018). If organizations are not ready to use the technology appropriately, it is hard to reap the full benefits (Amron, Ibrahim, Abu Bakar, Chuprat, 2019). Research indicates the idiosyncrasies of cloud deployment models entail a value-added process instead of a punctual replacement process for organizations transitioning to the cloud, revealing the importance of assessing the business value of cloud computing solutions according to organizational needs (Bian, Kang, Zhao, 2020).

Finally, an organization should evaluate their preparedness or maturity, which refers to the importance of assessing their abilities related to a novel technology. Organizational readiness is positively linked to project management, business process reengineering, training, education, and system integration (Jæger, Bruckenberger, Mishra, 2020).

## **Motivation to outsource**

Another critical argument pertained to understanding the motivation to outsource to cloud solutions. In addition to being a universal dogma, it seemed specifically urgent with cloud technology due to its complexity. On the one hand, its various options enable multiple opportunities. On the other hand, wrong usage or ignorance may engender costly liabilities for organizations misusing it. But more importantly, not understanding the reasons for going cloud and what to achieve with the technology may in the least be a waste of resources, and at worst, a costly, risky endeavor that might jeopardize operational efficiency with all the ramifications that entail.

The literature review gathered insufficient empirical justifications from a cloud perspective but is deemed relevant in a business context.

Outsourcing literature depicts various motivations for engaging with such initiatives. A common finding is an economic aspect. The increasing popularity of the cloud has enabled more organizations to transition to the cloud for money-saving motivations (Liu, Tan, Wu, Wang, 2012). Whether the money-saving aspect is viable is subject to scrutiny, but the financial incentive was legitimate long before cloud computing.

Motivation to outsource may include cost reduction, focus on core competence, access to expertise, process improvements, scalability, rapid delivery, ease of use, loss of control, fear, and security concerns (Asiatini, Penttinen, Kumar, 2019).

## **Digitalization strategy**

The last key argument for business readiness was to elaborate a plan for digitalization strategy. A strategy sets a framework for the organization to follow. The goal is to work as a single unit towards a common goal. With the complexity of cloud computing, it seems evident to incorporate a digitalization strategy, set up a framework for the organization, back it up with numbers and competence, and develop an action plan with multiple alternatives. A strategic, tactical, and operational perspective is vital to succeeding in a business climate characterized by volatility, uncertainty, complexity, and ambiguity. As competitiveness increases, margins may erode quickly, and the room for errors diminishes. As was expressed in one interview, it is about making the black box of innovation as small as possible, and engaging in incremental steps seems viable for successful digital strategy elaboration. It entails a better probability of success considering the risk. With the pace of technology only augmenting, not having a plan seems like a recipe for losing ground, if not organizational failure.

This finding was also consistent with extant literature but demands more research as it is a challenging task to accomplish. Extant literature has rarely investigated and validated practical transformation strategies related to cloud service selection problems and adoption.

Understanding the relative importance of critical success factors is inherent (Sharma, Gupta, Acharya, 2020). A challenge is to develop an adequate cloud strategy aligned with business strategy and an internal support program to manage demand. It requires planning, managing, and monitoring to ensure the best use and derive benefits and value from technological investment (Jones, Irani, Sivarajah, Love, 2019).

An organization implementing a strategic perspective focuses on core activities as the outsourcing permits enhanced product quality, flexibility, and agility, thus optimizing organizational processes (Prajapati, Kant, Tripathi, 2020). Moreover, Chang and Gurbaxani concluded that effective and timely decision-making is paramount when developing quality products and reaching strategic goals (Akbar, Khan, Mahmood, Alsanad, Gumai 2020). In addition, strategizing goes way beyond planning in cloud settings. All organizations transitioning to the cloud need to adopt a cloud strategy and integrate it with business and cybersecurity strategies. Cloud governance depends on clearly defined roles. All C-suite officers appropriate for the cloud should collaborate to ensure proper usage of cloud technology to reap all its benefits (Thuraisingham, 2020).

The findings around grasping business, motivation, and strategy were grounded in empirical evidence, thus validating the claim of business readiness. The next dimension of readiness related to the cultural aspect.

#### *5.1.1.2. Culture*

##### **ITs role in the organization**

An important finding was the evolution of the IT department. IT seemed to have cemented its influential seat at the table by switching from a more technical infrastructure orientation to more business-driven roles. Not to say that IT was never necessary for business, but the perception of IT has changed, and there is a crucial argument to be made around how to handle this cultural change. Management needs to acknowledge IT's role as more than a money-draining abyss. It is an essential decision-maker in automating business processes.

Moreover, IT people need to understand their role modulates from working behind the scenes to increasingly helping the business move forward by understanding how technology may help the organization. Thus, set a roadmap for actively engaging with management and ulterior departments. It might be a more considerable change for some than others. For those who are on board, it will only be beneficial. However, there might not be enough minds who acknowledge the importance of making this significant change yet. Organizations stuck for various reasons have a more substantial challenge as they stand at a crossroad with repercussions for years to come. There is no choice but to move forward. That is a scary thought if one has been content with the current position and reluctant to learn new capabilities. Nonetheless, it is mandatory to compete digitally in the market moving forward.

This finding was consistent with extant literature.

In 1993, the concept of readiness for change encompassed employees' perceptions, intentions, attitudes, and behavior. Readiness is considered an organizational capability to enable management to instigate change with reduced friction. The volatility of business influences readiness. Thus, it may lead to a successful implementation of change (Imran, Bilal, Aslam, 2017). Cloud computing transfers some of the traditional responsibilities of IT to external providers, thus transforming IT's role accordingly, affecting business. Hence the importance of ensuring alignment between these two departments (Fuzes, 2018).

Organizational culture facilitates or impedes the integration of individual learning with organizational learning through its impact on learning capabilities, information sharing, and decision making (Jæger, Bruckenberg, Mishra, 2020).

### **Organizational inertia**

Another argument related to the notion of organizational inertia. Individuals are creatures of habit. Changing habits may prove challenging for the organization. The consequences of changing are more severe than one could initially think. Informal side effects of instigating change could range from reservations and intense debates to negative stress, conflicts and attrition, sabotage, and more extreme adverse effects. Thus, facilitating change seems critical to move the organization as a whole in the desired direction. As several interviewees expressed, one is only as strong as the weakest link. This argument pertained to security aspects but is highly relevant in cultural change. Managing inertia may be a resource-consuming task if ignored but extensively fruitful if acknowledged and mindfully approached. Individuals' reluctance to change is widely discussed in the extant literature and rooted in validated theories such as Self-Determination Theory and Knowledge Management.

A discrepancy in individual competence level and environmental demands related to competence requirement may cause a phenomenological process giving root to stress (Fuglseth, Sjørebø, 2014). Users are more likely to stick to legacy systems due to system inertia or usage habits (Bian, Kang, Zhao, 2020). Transitioning to the cloud may imply a shift in governance and structure of the IT, which might entail layoffs of resources and require remaining resources to acquire new knowledge and capabilities such as governing relationships with providers and designing proper service level agreements to ensure quality. This radical change might spur cloud solution assimilation resistance (Wang, Liang, Ge, Xue, Ma, 2019).

In addition, employees' job anxiety is considered the most significant factor affecting the choice of cloud deployment model. According to research, the quality of existing systems impacts user satisfaction and intention to use in achieving system success. Introducing a new system may stimulate employees to perceive it as a threat to existing organizational procedures, modify the nature of working conditions, alter relationships with others, or reduce their status in the organization. Organizational inertia caused by technological resistance or lack of training may compromise significant investments in cloud computing by enterprises. Thus, proactive implementation of interventions may mitigate this resistance by ensuring adequate perception of the features and instrumental benefits of the system (Cengiz, Bakirtas, 2020). Furthermore, internal conflicts and employee's contentment with conventional systems may pose a problem even in innovative organizations. Other disputes involve financial losses regarding security and resource availability as organizations perceive cloud data liabilities such as cyberattacks and manipulation detrimental to finances and reputation (Sharma, Gupta, Acharya, 2020). As a remedy, cloud service users may extrinsically motivate colleagues by promoting the cloud to accomplish projects faster and cheaper, empowering and branding individuals as opinion leaders, affecting employees across the organization (Sharma, Gupta, Acharya, 2020).

## **Adaptation**

The key to handling cultural change was to incentivize adaptation. The different departments and individuals at all layers of the organization need to adjust and adapt according to the implementation of cloud technology for several reasons. First, to be better suited to apprehend the technology. Second, to localize potential areas of improvement or challenges. Finally, to reap all the benefits of the technology and the trickle effects that might occur.

Extant literature agreed on various methods to motivate individuals to adapt.

Self-determination theory (SDT) postulates how managers supporting employees' basic psychological needs in work-related settings reduce the probability of emerging negative somatic symptoms. Motivating employees induces autonomous self-regulation, and assessing these factors may measure emotional exhaustion, turnover intention, and absenteeism. A study among 287 Norwegian employees suggested social contextual, and motivational variables to impact work-related outcomes (Williams, Halvari, Niemiec, Sørenbø, Olafsen, Westbye, 2014). Intention or willingness to continuously exploit and extend the functionality built into Information Communication Technology (ICT) applications and the use of ICT at work are empirically valid critical success factors in measuring Information System success. Furthermore, technology malfunctions increase employee strain. Thus, integrating these factors into an analysis of employees' perception and inclination to adopt new technology is influential (Fuglseth, Sørenbø, 2014).

A study performed in local communities of computing education in Norway indicated the importance of providing a supportive learning environment through proper training and adoption programs to induce skill development in line with future expectations. Attributes such as problem-solving, critical thinking, communication, collaboration, social and cross-cultural skills, productivity, leadership, and responsibility may impact considerably (Mavroudi, Divitini, Giannakos, Jaccheri, 2017).

Employees who are not comfortable acquiring new technology capabilities or more inclined towards conventional working methods may impede business processes (Sharma, Gupta, Acharya, 2020).

Management must possess adequate leadership skills to mitigate disputes. Intrinsic motivation is essential in influencing the time consumed to acquire results according to expectations from technological innovation. Finally, entrepreneurial mindsets focusing on innovation, risk-taking, and proactive technologies will benefit more from cloud computing (Cengiz, Bakirtas, 2020).

## **Commitment**

To facilitate a cultural change, individuals across all layers in the organization needed to adopt cloud technology and use it. As was expressed in an interview, this cannot apply halfway, and coercing into commitment is generally more damaging than advantageous. Going back on a decision to cloud source can be a costly endeavor if there is no alignment at the C-suite level. Some interviewees expressed the nuance that, in theory, an organization can change cloud solutions providers as long as they are familiar with the technology and possess the expertise to act accordingly. Nonetheless, organizations need to commit out of volition to engage with novel technology. Thus, securing commitment is critical.

There is enough empirical evidence to highlight the importance of organizational culture and the challenge of modifying it.

Change management is fostered through building acceptance and commitment to change, addressing resistance, communication, understanding benefits and drawbacks, education, assessing organizational culture problematics, a change management program, preparation for change, and assessing the impact of attitude (Finney, Corbett, 2007). Inducing commitment from all layers may be executed by trust and use of cloud representatives that influence employee attitude through their expert power and influence. Cloud solutions are innovative, and their adoption may instigate a sense of mastery and pride for the employees. Familiarizing with cloud solutions is an incremental process involving experiential learning transferrable across different cloud services. Thus motivating employees and committing them may engender synergy beneficial to innovative behavior (Garrison, Rebman, Kim, 2018). Integration mechanisms such as economic incentives, social rewards, and organizational learning may be helpful to achieve strategic goals (Ouyang, Cao, Wang, Zhang, 2020).

Acknowledging the evolution of IT, addressing resistance, and incentivizing commitment were firmly grounded in the literature, thus reasonable measures for readiness. The last dimension of this first critical success factor concerned the cloud.

#### *5.1.1.3. Cloud*

##### **Business process management**

The last part of readiness pertained to integrating cloud-relevant business processes with ordinary organizational processes. Again, the technology's immense capability forces organizations to formalize standardized procedures and evaluate their protocols to fit cloud computing. As was expressed in an interview, documentation is how external parties can keep oversight of projects and customer relationships. Also, the recommendation of starting an inventory project seems highly valuable to get things right from the get-go. Institutionalizing procedures is a way of legitimizing working methods. However, too much formalization may engender rigidity and inertia. It seems to be a double-edged sword organizations should integrate into their readiness assessment. Besides, with cloud computing being a massive paradigm with uncharted areas, organizations are wise to have their documentation in order if aiming to automate business processes. It might be less of a problem in European countries as regulations standards are common, and most serious organizations strive to attain them. Still, this might be more of a liability in other regions or less developed countries.

Nonetheless, understanding the cloud means grasping its impact on organizational processes. Adaptation is inherent as cloud infrastructure is more or less standardized. Organizations that seek to employ cloud solutions must be ready to revise their procedures. Introducing novel technology might shed light on areas of improvement, others to instore, maybe even some to abolish. The capability to execute this is highly relevant for the cloud journey.

The technology is all about automating business processes, making it intelligent enough to help the business. As was expressed in an interview, the system is more intelligent than the employees and more effective. Thus, organizations should recognize this and be prepared to reconfigure their business accordingly. This finding of aligning capabilities traced parallel to a well-established resource-based view and knowledge management theory.

A system must match the business processes (Finney, Corbett, 2007). Cloud capabilities have transformative value when they are combined to generate strategic value. Research asserts that practitioners understand little about how cloud solutions may enable service delivery and align organizational processes to improve performance (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018). A solution that organizations may want to embrace going forward is the design of business processes according to the objective of cloud deployment to align business processes and risk management, thus mitigating risks (Wulf, Strahringer, Westner, 2019). Business process reengineering (BPR) often appears as a critical success factor in change management because systems develop based on best practices in organizations. BPR is also essential to manage employees' reactions to modifications in organizational processes and persuade them of more efficient working methods (Jæger, Bruckenberger, Mishra, 2020).

## **Governance**

The notion of governance was highlighted in many facets and seems critical to use cloud computing technology properly. Factors such as management control, contracting, organizational culture, working methods, and organizational structure affect the cloud. Corporate governance will determine how to work with the cloud and how the organization should appropriately incorporate these solutions.

There is plenty of literature on governing organizations internally and externally by contracting with partners and pointing out its variable negligence depending on responsibility in the organization.

There is a trend for business managers to focus on the benefits of cloud computing and undermine IT governance. IT managers focus on the liabilities of cloud computing and want to strengthen IT. It is paramount to rethink and reconfigure the roles and responsibilities of business and IT departments to align them for proper technological governance (Khalil, Winkler, Xiao, 2017). Governance mechanisms seem to remedy friction, thus enabling success in Information Technology Outsourcing (Könning, Westner, Strahringer, 2019). The absence of appropriate rules of business processes endangers information technology-enabled process management practices (Aydiner, Tatoglu, Bayraktar, Zaim, 2019). The lack of a proper governance framework supporting cloud objectives impede the successful adoption of cloud computing solutions. It is essential to address challenges and maximize organizations' return on investments when engaging with cloud computing solutions (Bounagui, Mezrioui, Hafiddi, 2019). Cloud dynamism necessitates constant monitoring of queries and resources, changing landscape, schedules and prices, appropriate service selection, and concrete plans to reach cloud objectives. (Belgacem, Beghdad-Bey, Nacer, Bouznad, 2020).

Thus, organizations using cloud solutions share responsibility with cloud providers to ensure the cloud's proper governance. Organizations must apply careful cloud behavior, abide by cloud policies, educate their human resources in the accessibility of the cloud and devote human resources with authority to handle interactions with the provider (Thuraisingham, 2020).

### **Hype versus the reality of business**

Another critical point was the discrepancy between hyped-up trends and business reality. We live in a world characterized by a red sea of knifing actors competing for market shares and customer attention. Thus, rush for profits and shareholder pressure incentivizes glorified sales pitches and promises of cloud Eldorado's. As hypes and buzzwords capture attention, organizations must grasp the asymmetry between the reality of cloud usage and marketing forces exploiting the psychological mechanisms of consumer behavior. Organizations aware of these anchoring effects are better suited to assess what cloud is and not objectively. As the name itself demonstrate a particular delusion that technology is suddenly floating in the clouds, the reality is that technology has been centralized and moved to servers managed by somebody else. It is still a server, regardless of the size of the complex managing it. Organizations would be wise to integrate this in their readiness assessment to see if they are ready for the cloud or solely swayed by cloudy promises of marketing slides and salespeople.

Far from all salespeople, but salespeople nonetheless. It is critical to discern the extravagant promises of promotional campaigns from the reality of technology implementation and usage. One can compare it to watching glorified tv-series boosted with visual effects and elements to trigger human emotions. Truth is a lot messier and less glamorous. Fancy pitches aim to hook customers. Organizations would be wise to understand the actual complexity of using cloud solutions and the intricacies that arise from them. Thus, in turn, assuming more responsible and advantageous cloud behavior.

This finding materialized somewhat in the literature, specifically related to cloud economics.

Online tools exist for cloud cost calculations of the total cost of ownership and return on investments to segregate the promises of a marketing slide and realizing the severity of the implications of transitioning to the cloud (Rosati, Fox, Kenny, Lynn, 2017). One finding related to change management cost stating free training advocated in promotional messages was insufficient to gain the necessary cloud skills. Transitioning to the cloud invokes an organizational change across the organization from project management processes, reconfiguring the top management and IT department from the classical waterfall approach to agile methods, even extending the IT personnel in some cases for improved monitoring (Maklouf, 2020).

### **Fake clouds and exponential growth of the market**

A surprising finding was how some actors exploited the notion of cloud by disguising traditional IT infrastructure with cloud-based web interfaces to call themselves cloud organizations. However, this opportunistic behavior is not unexpected in current business climates. Nonetheless, the importance of being aware of these actors and how they may impact the organization's use of cloud computing seem critical. Especially since a cloud investment is a long-term investment, getting it right from the start is paramount.

Critical thinking, mindful assessments, strategic decision-making should enable organizations to discern the appropriate actors from those operating as fake clouds, making them more ready to use cloud computing technology. It might seem superficial and non-realistic as organizations have enough on their plate.

However, choosing the right cloud computing solutions demands that organizations select the right provider. A cloud computing market experiencing exponential growth requires a specific understanding of the players in the market to choose the appropriate solution. No provider will reject a customer in today's competitive market, especially not those operating under the veil of fake clouds. Thus, organizations must act responsibly when choosing a cloud solution. Both because it's a better strategic decision to choose right from the start, and it enables organizations to stay on top of trends, being proactive instead of responsive. As was mentioned in an interview: you make the right bet.

This finding was not observed in extant management literature, but relevant for future research as transparency and viable solutions are essential for sustainable advantages.

The literature depicted variables related to business, culture, and cloud readiness through various aspects, rendering readiness a relevant critical success factor for the study. The second pertained to competencies.

### 5.1.2. Competence

The notion of competence emerged along internal and external dimensions, respectively relating to inside the organization and outside.

#### 5.1.2.1. *Internal*

##### **Management**

Management is at the steering wheel of any organization. It determines objectives and is accountable for its actions. Thus, it occupies a critical role in managing the knowledge necessary to integrate cloud computing solutions in the organization and operate them. There is no need to say that this will cascade down the rest of the organization if management lacks appropriate competence. One might even emphasize this importance by separating between management and leadership. The latter is the most critical to consolidate organizational readiness with organizational competence. It implies thinking ahead and leading the rest of the herd in the chosen direction for goal achievement and alignment strategically.

This finding was consistent with extant literature.

Managing change in a project may prove a challenging endeavor. Failure to do this correctly may result in grave repercussions for the system development, leading to increased cost overruns, varying requirements, endless testing project failure, and business loss. Projects with a high complexity level necessitate adequate management to prevent unsatisfactory repercussions. A change management framework might be hard to establish. Its complexity entails a deep understanding of the underlying mechanisms of change identification, analysis, and cost estimation in a given context, to materialize a proper change management strategy (Jayatilleke, Lai, 2018). An exciting nuance pertained to the role of management according to organizational

goals. The focal objective of an Information Technology Outsourcing (ITO) relationship will determine the importance of top management in ITO success.

The more strategic the plans, the more vital top management support becomes in Information System decision-making, including implementing outsourced technology and Information Technology's (IT) role in organizational strategy. The more economical the goals, the more focus on joint initiatives with providers is relevant (Könning, Westner, Strahringer, 2019). Top management support emerged as the most cited critical success factor across empirical studies. It included top management support and commitment throughout a project and the importance of a project champion. Project management was also essential to ensure successful projects by using concepts including team coordination, project cost planning, team morale, and motivation (Jæger, Bruckenberg, Mishra, 2020).

Moreover, an empirical study effectuated in Jordan's private health sector showed a positive relationship between talent management and competitive advantages when mediated by the phenomenon of cloud computing. Findings indicated talent management to be beneficial when institutionalizing its application to obtain competitive advantages and navigating highly competitive environments. (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021). As we live in uncertain times, being aware of managing talent seems increasingly significant.

### **Tone at the top**

Furthermore, the tone at the top was a deal-breaker in the success of most organizations. As it paves the way for attitudes, reflections, and reactions, it is essential to hold the line and divulge the idea of control across the organization. It is not juxtaposed with maintaining an iron grip and micro-managing company employees. Even though this management philosophy might occur in certain cultures or organizations, the point is to light a fire in employees instead of underneath them. Inspiring them to engage with the idea of novel technology, promoting knowledge sharing, teamwork, cross-department collaboration, and providing adequate tools to ensure action consistency in the long term is crucial. It secures a smooth transition to revolutionizing working methods while keeping the workforce in line, maintaining control of the steering wheel.

This finding was consistent with empirical evidence.

Management has the power to decide on technology usage in the organization. Therefore, a positive inclination at the top will trickle into other areas such as budgets, training, and employee motivation. Management is the first mover influence, thus the importance of their support cascading throughout the organization to help employees feel comfortable to use new technology and perform better (Amron, Ibrahim, Abu Bakar, Chuprat, 2019). Top management impact organizational autonomy through resource supplying such as change management implementation and vision sharing for common understanding. However, this effect may dissipate in the occurrence of high-level organizational inertia (Wang, Liang, Ge, Xue, Ma, 2019). Substantial management effort is critical for a successful cloud journey (Maklouf, 2020).

Finally, management is a critical success factor in an organization's ability to create value. An organization's transition to the cloud will be affected by external pressure and internal pressure from employees or top management. Given that management is inclined to take the risk of investing in the technology (Shao, Yang, 2021). Many factors impact digital transformation success, but one of the most critical is a skilled and competent leadership organized into appropriate roles (McCarthy, Sammon, Alhassan, 2021).

### **The shift in ITs role**

As the function of the IT department evolves, the Chief Information Officer (CIO) has become a crucial part of the organization by bridging a gap between IT and business, conveying the pros and cons of utilizing cloud technology and how it strategically fits with the business needs of the organization. The old role of the CIO as a gatekeeper for technical IT problematics has transformed into an IT-business hybrid, validating its importance and relevance for management decision-making. Organizations able to exploit this role to the fullest will probably develop better IT capabilities, address challenges and locate areas of improvements or opportunities. As technology increasingly affects and shifts the boundaries of business, so does the competence of the CIO. He assumes the role of an IT expert with business insights able to mobilize its department resources with all the aspects that entail and convey its usefulness to the rest of the organization and possible relationship partners, which is critical for organizations transitioning to the cloud.

This finding was consistent with extant literature stating CIO's role might include more than one individual. Cloud computing, object connectivity, and access to data conduct small and medium enterprises towards an external delegation of the CIO function, potentially outsourcing a vital part of the organization. CIO's are responsible for hardware and software components in addition to selecting and operating IT services. Thus, assuming the role of auditing solutions offered by cloud providers, managing data flow to suppliers, and revising reversibility plans in case of data return or supplier substitution. It is reasonable to regards these factors as key to cloud migration (Bouaynaya, 2020). According to Gartner, CIO's role is critical in reconfiguring mindsets and best practices in the context of transitioning to the cloud. They predicted that by 2021, change management would be the CIO's responsibility as the Human Resources (HR) officers. Thus CIO's need to adopt an agile mindset (Maklouf, 2020). Today's IT leadership is not amenable to one individual; therefore, the tasks must be separated to ensure proper digital transformation and alter organizational structures and processes. Together, this team may manage people, processes, and technology adequately to ensure readiness for a transition to a new digital program (McCarthy, Sammon, Alhassan, 2021).

### **Know the platform**

With the various scenarios of using cloud computing solutions and the costs of misusing them, knowledge about the platform employed was essential. Good competence enables a better and faster understanding of the technology. It mitigates adverse consequences such as cost explosions or damaging information sharing and security exposures. It allows players to gain knowledge and retain it within the organization. It is also a way to discern areas of concern, curiosity, and development that might be conveyed to the partner to improve both the system and the relationship between engaging parties.

Relational governance may mitigate the concerns and rigidities of agreements. The intangible value of such as relationship has enormous implications for all parties involved. Organizations transitioning to the cloud would be wise to acknowledge this effect. As was expressed in one interview, working with the customers and partners to improve people, processes, and technology might be critical to secure a prosperous cloud journey.

This finding was consistent with extant literature warning organizations against going cloud without a complete picture.

Transferring data into the cloud too fast may be challenging if the business fails to adapt to the environment. Proper understanding of the cloud platform before usage mitigates unforeseen obstacles such as data breaches (Bian, Kang, Zhao, 2020). Moreover, some researchers assert that cloud customers lack precise guidelines and criteria to obtain a holistic view of the requirement for transitioning to the cloud. A study revealed that many IT managers do not anticipate costs such as lack of vendor transparency, ongoing maintenance costs, and lack of cloud expertise (Maklouf, 2020). Cloud Computing agility might evade if its tools are not understood and appropriately exploited. Organizations need to know how to implement cloud technology and reap its benefits to boost desired operational activities and achieve competitive advantages (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

### **In-house expertise**

In traditional outsourcing, knowledge rests in organizations specializing in that function, more or less. It seems that defining in-house expertise in the cloud computing paradigm becomes more complicated. Organizations cannot outsource the whole responsibility to a partner and relinquish all expertise regarding the cloud. Then comes into play how to define the adequate knowledge to retain inside the organization and what to outsource. To ensure proper supervision of cloud computing solutions, a team needs to be stationed inside the organization and know the cloud solutions. Organizations should assess expertise before going cloud to ensure operational efficiency, maintain proper communication and collaboration with cloud partners. As mentioned in an interview, speaking the same language is key to aligning interests, boosting good cooperation, ensuring adequate auditing and liability discovery.

This finding was more nuanced in the literature, stating that the education of employees to retain expertise in-house and liaison with external partners was essential but somewhat overlooked. It classifies as a misconception critical for organizations to understand before going cloud.

Literature asserts the need for a project champion to be a critical success factor in complex IT project implementation as an individual equipped with leadership, business, technical, and personal managerial competencies. The need for project management is also inherent by allocating responsibilities, defining project milestones, training human resources, determining the measures of success, and coordinating with consultants (Finney, Corbett, 2007). Empirical evidence suggests some IT Departments take on the role of brokers between organizations and services hosted externally. While some organizations employ these intermediaries, other organizations rely entirely on the data centers' technical staff, indicating no need for in-house expertise but rely on pre-agreed Service Level Agreements with cloud providers, affecting the skill

base in IT companies. Some universities, for example, employ Microsoft 365 for managing email, relieving the IT department of that duty (Buyya, Srirama, Casale, Calheiros, Simmhan, Varghese, ... & Shen, 2018). However, appropriate training of cloud users is critical to facilitate the technical success of implementation and make organizational processes more effective and beneficial to business. The development of proper IT skills ensures knowledge transfer from consultants to end-users. Research shows that training impacts operational performance significantly and is also the first victim of budget austerity measures. Preparation may get executed as a last resort after implementation due to lack of time before going live with the project (Jæger, Bruckenberg, Mishra, 2020). Customers have to take responsibility for their education in the information systems they decide to use. Studies reveal a significant positive effect on organizational performance and effectiveness. Training may also accompany knowledge management to impact business performance (Jæger, Bruckenberg, Mishra, 2020).

### **Lack of knowledge**

One of the most significant findings in the study was the precarity of expertise in the market. As the most prominent actors recruit the best heads with attractive revenues, cloud computing experts are scarce resources. With the hype pushing all industries to go cloud, it is not hard to observe the asymmetry between expertise and resource scarcity. It has various ramifications. First, the competition for cloud heads is fierce. It might pose a question of the variation in the quality of the remaining expertise. Finally, it makes organizations think about acquiring and retaining knowledge in-house. Using cloud computing solutions necessitates appropriate knowledge. Thus, proper recruitment is vital since expertise is scarce. It also spills into the way one runs the organization and treats employees. A healthy organizational culture, well-established, agile processes, awareness of this lack of knowledge, and consequences for the organization, are hard to discern initially but still impact the organization.

This finding was almost absent in effectuated literature review, which deems it highly relevant for future research. However, it mentioned academia's recognition of more business-related approaches and that cloud computing might mediate access to skilled individuals.

The literature argues that a change in demand has forced educational institutions to reform syllabus to develop new areas of study such as self-regulated learning, collaboration, critical thinking, and creativity. Also, global competition has impacted academia to change from collegial practices to a more professional management approach (Hechanova, Caringal-Go, Magsaysay, 2018). As a remedy, cloud computing outsourcing platforms provide advantages to the industry through skilled human resources (Akbar, Khan, Mahmood, Alsanad, Gumai, 2020).

### **Collaboration and knowledge sharing**

Data and information drive most modern organizations. In a society where speed and seamless processes are essential, it seems critical that collaboration and knowledge sharing are at the center of this objective. As was mentioned in an interview, there is a tendency for siloed organizations. Promoting knowledge sharing and mitigating friction will enable collaboration and competence development. Cloud computing solutions benefit the entire organization.

There are several aspects to this. First, by engaging with the technology and sharing information about experiences, departments can learn from each other and strengthen everybody simultaneously. Second, collaborating improves business processes by leaning on effective communication, hindering unnecessary work, ensuring everybody has the information they need and detect inconsistencies quickly. Finally, knowledge sharing and collaboration strengthen the organization because they work as one synchronized agile unit materializing intangible benefits. It's a strategic benefit that is hard to quantify but with immense repercussions for organizations transitioning to the cloud.

This finding occurred in the literature explicated both by the benefits of cloud computing for disseminating knowledge and the risk of inhibiting collaborating if lack of understanding of cloud technology itself. With all the benefits of cloud computing, it might be tempting to engage blindly. However, the various functions and ways of using CC may also impede collaborative performance and impact organizational performance due to interoperability issues. Organizations employing multiple forms of IT and cloud computing services should clearly understand the underlying mechanisms of interoperability and related uncertainties to benefit from the competitive advantages of cloud computing (Schniederjans, Hales, 2016). Furthermore, a propensity for information sharing is critical for processing ICT connectivity. This function may be limited in traditional IT systems. It is not suitable or compatible when operating in a dynamic business climate (Shao, Yang, 2021).

Management, IT responsibilities, in-house expertise management seemed like valid measures of internal competence for cloud migration. The next part will center on the external dimension of competence.

#### *5.1.2.2. External*

##### **Consultancy skills as a source of knowledge**

Consultancy exists for a reason, and there are clear advantages to employing them. They are highly relevant to cloud computing solutions, a vast area developing continuously with many uncharted waters. It is hard to know everything. Hence there are benefits to leaning on consultants specialized in these topics. It might alleviate knowledge gaps and provide a sense of comfort and a fresh outside perspective. As consultants are cooperative solution seekers, they might be critical for organizations lacking cloud expertise. They have an opinion, are passionate about technology, accountable for their actions, and provide an opportunity to exploit their competence. However, as mentioned in interviews, good cloud knowledge is scarce. One needs to find the appropriate skills and still preserve some expertise in-house to engage with the consultants strategically. It does not mean organizations relying on consultants do not succeed. However, consultants are there to consult, and eventually, they leave with their competence. It's the organization's responsibility to be aware of this and retain the knowledge provided by the consultant internally. Just as no cloud provider will call you to say you haven't backed up your data, a consultant most probably won't call to point out you haven't backed up the knowledge he or she has provided. As was mentioned in one interview, everybody has their agenda.

Those are the rules of engagement in business, so managing knowledge and ensuring its ingrained in the organization is critical. Thus, finding the proper expertise becomes inherent.

Nonetheless, it is crucial to foster the ability to derive IT capabilities from external partners and use them as sources of knowledge. The traditional mindset is to let the partner take care of that function. A more modern philosophy consists of exploiting external partners as sources of knowledge to successfully build the IT capabilities required to transition to the cloud. An organization lacking expertise may seize an opportunity to develop and retain that knowledge by creating a healthy relational governance partnership. Again, this is the organization's responsibility to properly set up the necessary process to extract, integrate, and institutionalize this knowledge. A beneficial cloud relationship is a long-term one. It seems critical to invest in the partner that detains the exact knowledge one is missing. Exploiting it to the fullest implies a mindset of strategic alliances and transformational relationships instead of looking at organizations and partners as solely transactional relationships. With a proven methodology repeated extensively across organizations and business contexts, their source of knowledge might prove valuable for companies seeking to transition to the cloud.

This finding was consistent with extant literature.

It is imperative to instore processes for knowledge transfer from the consultants to the organization to mitigate dependency on external parties, whether by consultants or providers (Finney, Corbett, 2007). Consultants provide expert power, reduce customers' learning burdens, and help configure systems properly. They also play a mediating role in smoothing communication and resolving internal conflicts. However, consultants may also pose a risk related to knowledge transfer to customers. Since the consultant fills the gap between existing and required knowledge, it is inherent for organizations to make sure they retain that knowledge (Jæger, Bruckenberg, Mishra, 2020).

Furthermore, tailoring the capabilities of complex IS systems with organizational structure and processes is a crucial challenge to overcome. As every organization is different, the only way to assess the proper compatibility is after the effectuated process. The expertise is generally too vast for a single organization to detain unless through experiential learning. This is where the consultants may exploit their competencies to deliver worthy value propositions to customers (Jæger, Bruckenberg, Mishra, 2020).

### **Use knowledge for best practices**

Another interesting point was that big IT organizations adopt trends very fast. Organizations should integrate this knowledge into their competence portfolio as it is free experimental knowledge applied in business. Engaging with them enables access to innovation capabilities beyond measures that organizations can exploit. And if they choose not to be part of it, they are observers to live business experiments from which they can learn. As innovation is critical, organizations transitioning to the cloud need to understand the severity and amplitude of innovation knowledge and how to apply it according to their organizational objectives combined with the usage of their chosen cloud computing solutions.

Moreover, acquired knowledge may be integrated into the organization and consolidated to form best practices.

As was expressed in an interview, external partners possess superior expertise in their field, incrementally aggregated during their existence. This experience translates into best practices that organizations can assimilate. By fusing their working methods with external best practices, superior knowledge integrates quickly. It helps them move forward efficiently, thus acquiring knowledge that trickles into organizational processes and technology improvements.

This finding was somewhat consistent with extant literature.

A shift from on-premise to cloud is not juxtaposed with roles, actors, activities related to IT magically disappearing but outsourced to another actor. From a customer's perspective, this entails a shift of complexity from on-premises infrastructure to an external party. With this shift in infrastructure complexity inducing a standardization in enterprise software, the role of consulting actors also shifts from an IT-intensive position to a business process management role. Especially in the public cloud environment where best practices approach, standardized processes, and limited customization opportunities are inherent. Therefore, it is paramount for organizations to collaborate with partners to properly examine best practices and compatibility with their business models (Nieuwenhuis, Ehrenhard, Prause, 2018). Organizations with robust and unified self-awareness will positively affect work success, pertaining to the positive influence of knowledge sharing on ITO success. Research on organizational learning indicates strong evidence that relational and procedural learning improves value creation and organizational performance. Experiential learning impacts service quality and the client's propensity to invest in ITO (Könning, Westner, Strahringer, 2019). Moreover, absorbing cloud technology necessitates modifications in organizational structure and processes, implying organizational learning to assimilate the novel knowledge (Wang, Liang, Ge, Xue, Ma, 2019).

### **Optimization**

Continuous optimization occurred as a critical part of the cloud journey. An endless cycle of making the system better entailed shifting from traditional investing and rarely updating to continuously optimizing to make the system better and advance. There were two facets to this finding. First concerning financial optimization. Organizations need to have competence around the fact that cloud investment entails gradual management of its cost structure. In the beginning, the cost will spike due to the transition, and with knowledge about the system and business requirements increasingly aligned, financial optimization occurs. The second pertained to technical optimization, which means that with time, organizations get more acquainted with the solutions, how it complements business needs and optimizes accordingly both in light of organizational goals and according to external developments. These two facets should interact in symbiosis to ensure successful cloud computing usage.

This finding did not occur during the literature review but is highly relevant for future research.

### **Cloud loop of knowledge**

One of the most significant findings of the study concerning critical success factors for an organization transitioning to the cloud was the endless cycle of readiness, governance, and optimization. The proposed framework seemed aligned with today's business climate and the behavior organization needed to adapt for a

prosperous cloud journey. The readiness part might seem universal and evident, the same with governance as extensive literature regarding this phenomenon exists. Even optimization is somewhat known, but the alignment of these three critical factors and the need for continuous revising of this cycle is innovative and inherent for organizations to understand in a cloud context. As things change fast, so can requirements, conditions, and objectives. An organization that wants to succeed when using cloud computing solutions needs to be mobile enough to adapt to any situation. Thus, important to always use these elements to evaluate one's position and alternatives. As was said in one interview, to be synchronized with the market to seek opportunities, fend off threats, mitigate weaknesses and consolidate strengths. Knowledge about this loop may be critical for organizations navigating cloud computing waters.

This finding occurred to some extent in extant literature but merited far more research.

Research referred to a particular 3M strategy which implies measure, monitor and manages cloud solutions to mitigate hurdles that would endanger the value appropriation of those solutions (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018). This strategy resembles this finding and deserves more scrutiny.

### **360 view of the organization**

Another significant finding was the notion of the 360-degree view of the organization. Cloud computing solutions can enable information sharing to translate into knowledge and gain superior oversight over their business process. Another impact of this usage is the deconstruction of siloed departments and individuals with access to the same information using the same system. As mentioned in interviews, Sales, Marketing, and Customer Service have access to the same customer information. Employees and managers have access to historical data, contracts, track their progress, achievements, and agreements. It illustrates the alignment power of cloud computing solutions. Everybody uses the same system, has access to the same data, and can make informed business decisions as one synchronized unit. Thus, possessing knowledge about this effect is critical to reducing friction, exploiting cloud solutions to the fullest, and conveying these advantages to the organization and other relevant parties. For individuals resistant to novel technology, these arguments might be vital in persuading them to engage with it. It might even soothe technological stress induced by new systems perceived as complex by employees.

This finding did not occur in the literature review but merits more research.

The importance of collaborating with the ecosystem, exploiting learning to derive and build IT capabilities, and finding novel ways to optimize organizational processes seemed worthy determinants of competence's external dimension. Together, internal and external expertise make the foundation for the critical competencies organizations need to assess when transitioning to the cloud. The third critical success factor pertained to the well-established phenomenon of transaction costs.

### 5.1.3. Transaction Cost

#### **Lack of knowledge**

A recurrent observation was that organizations would jump into the cloud without knowledge about the system, its impact on daily operations, cost, security, nor how it complements the organizational purpose in the first place. Whether deliberate or constrained by other factors, lack of knowledge incurs hidden costs. Thus, it may prove detrimental to the organization's usage of cloud computing solutions. Not every company has a million-dollar investment to spare if one fails. Moreover, as was mentioned in an interview, failure to comply with specific regulations such as GDPR can severely damage even the more financially solid companies. So knowledge is critical to mitigating unanticipated transaction cost that might occur in a relationship and derive benefits.

This finding appeared in the literature.

Many small organizations lack the knowledge of cloud computing technology's details and, by default, cannot grasp the disparities between platforms, applications, services, and other cloud elements (Xiao, Sarker, Wright, Sarker, Mariadoss, 2020). Organizations may benefit from outsourcing through the access to expertise detained by human resources across the globe, revamping competition, strengthening service quality and resource utilization (Prajapati, Kant, Tripathi, 2020).

#### **Challenge to find the right expertise**

Finding the right skills entails knowing what skills to look for in the first place. In addition, the complexity of cloud solutions poses an additional problem in finding the right expertise. Especially since an organization without prior knowledge has no way of validating if the expertise is compatible with the business in helping it attaining its goals beforehand. It makes it very challenging to get external knowledge without trusting that they can support the organization. So it quickly becomes a tradeoff for an organization that doesn't possess the necessary expertise in-house. Therefore, it becomes critical for an organization to assess and critically evaluate the expertise they are coming across to see if it is worth the investment. Blindly outsourcing to an external party can be a costly endeavor and a regrettable decision. Moreover, the lack of relevant cloud computing skills aggravates it.

This finding was absent from extant literature. Thus, demanding more research.

#### **Auditing for cost control**

Proper auditing mechanisms would mitigate unwarranted costs. The danger of utilizing cloud computing solutions without maintaining an overview can quickly spike the cost curve, impede the organization and enable negative consequences. The worst-case scenario is that the cloud solution fails and incurs additional costs. As one interviewee mentioned, reversing a decision to go cloud was dangerous.

This idea occurred in the literature review.

Migration of on-premise IT infrastructure to cloud solution implies migration of internal IT department to a cloud provider. This migration of existing services needs to integrate a social and economic perspective when using cloud services and consider risk liabilities such as uptime and availability and how those factors

impact the need for internal expertise (Buyya, Srirama, Casale, Calheiros, Simmhan, Varghese, ... & Shen, 2018).

#### 5.1.3.1. *Vendor lock-in*

One of the most exciting findings and the most discussed transaction cost in the literature review was the vendor lock-in. There seems to be a tradeoff when opting for cloud solutions with organizations seeking to be agile and strategic. Thus, the idea of locking into a relationship and suddenly being dependent appears counterproductive for the agility required in today's market.

Nonetheless, one cannot survive alone in the jungle. So choosing the suitable poison is a good analogy provided in the data to materialize that the market is not perfect; there are risks to take at every turn. Hence organizations need to choose accordingly.

This finding was nuanced in the literature by iterating the complexity of choosing a provider and the lock-in effect contingent on contextual factors such as contract clarity. Nonetheless, the lock-in remains a viable obstacle to surmount.

In highly competitive markets such as IT service outsourcing, providers depreciate bargaining power in contract negotiations. Low levels of client dependency represent a possible risk. Thus, a lack of contract compliance occurs due to ambiguity in contract formalization (Könning, Westner, Strahringer, 2019).

Therefore, choosing a cloud service may prove a costly and intricate process (Maklouf, 2020). Nonetheless, SaaS models frequently characterize a service delivery model with lower lock-in effects than on-premise solutions (Xiao, Sarker, Wright, Sarker, Babu, 2020).

#### **Accept it**

With the multitude of providers present in the market and options increasing in number, organizations needed to accept the lock-in effect and its potential drawbacks. Acceptance of this notion may alleviate unnecessary headaches and liabilities for all parties, making it easier to engage in a long-term relationship. Approval may also still the monkey mind of organizations fearing for their independence and looking to scheme all over the place to get the best possible deal with several providers. As was expressed in one interview, it may cause more headaches than remedies. By accepting that there will be a lock-in, organizations may focus all their energy on looking for that one solution or provider that is most appropriate for their business achievements, hence be much more effective. It has indirect consequences for the rest of the organization that witness a straight command line with specific objectives instead of insecure, unclear organizational behavior and its repercussions on employees.

This finding was nuanced from the literature that underlined that vendor lock-in is an issue, especially for more prominent companies. The systems themselves are standardized but not on common ground, an understandable business perspective, as they all have to secure profits to pay for investments.

There is empirical evidence related to the disregard of the vendor lock-in problem. A solution proposed is the standardization of services. However, cloud providers have not entirely adopted it (Bouzerzour, Ghazouani, Slimai, 2020).

Lack of standardization in the cloud computing industry engenders vendor lock-in effect (Cengiz, Bakirtas, 2020). Cloud Service Providers do not generally allow organizations to juggle between various vendors, creating this effect that may be costly for organizations (Akbar, Shameem, Mahmood, Alsanad; Gumei 2020). They lock clients to a specific provider preventing fair competition in the cloud market. Enterprises, developers, or end-users may defer from deploying applications or migrating legacy systems to the cloud because of the vendor lock-in. As a result, clients may experience service anomalies, price increases, service failure, or data loss.

However, interoperability may be vital to enabling clients to switch providers according to their demands (Bouzerzour, Ghazouani, Slimai, 2020). Organizations are cautious with cloud solution adoptions due to uncertainty regarding interoperability between management resource planning tools such as Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) caused by a lack of interoperability between SaaS. The leading cause relates to the cloud providers focusing on deriving added value from their software by offering tailored services compared to competitors (Bouzerzour, Ghazouani, Slimai, 2020). Therefore, many enterprises are hesitant to migrate critical applications to the cloud due to the underlying proprietary technology. Interoperability between service providers is the biggest challenge following security for cloud computing adoption. Proprietary systems limit an organization's ability to retrieve data and transmit across systems by ignoring storage methods and data format processing. Thus, operating data portability creates vendor lock-in. However, the Open Group Cloud Work Group aims at aligning understanding between buyers and suppliers by providing open standards to secure data portability and cloud computing reversibility (Bouaynaya, 2020).

### **Adapt the services to the platform by standardizing components**

Another finding suggested that organizations adapt their services to the chosen platform to mitigate the lock-in effect. Again this forces them into standardized processes of the cloud without necessarily meaning the organizations lose their originality. Moreover, modulating services according to the chosen cloud solution may alleviate transaction costs by moving easier between providers if services configure to the respective platform. However, this implies the necessary knowledge to ensure these technical tasks. Organizations aiming to mitigate the vendor lock-on may standardize their components to transfer them across platforms. It is feasible but requires technical expertise in cloud technology architecture. Standardization reduces discrepancies and facilitates leaner processes, reducing the chance of being dependent on a single platform. This finding was not observed extensively in the literature. Hence, it requires more research. Organizations may appropriate strategic value from cloud solutions by developing composite resources to create value by exploiting the cloud's service orientation (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018).

## **Code your infrastructure**

Another way to mitigate the lock-in was to code the organization's infrastructure to deploy it across various providers. It seemed like the optimal countermeasure for the vendor lock-in. Whether it is feasible and the actual effects of such coding across the different platforms are subject to scrutiny. Nonetheless, it presents a viable solution for this type of transaction cost.

This finding was somewhat mentioned in the literature but demands more research.

In some cases, organizations may have to write codes to structure the timely deployment of resources to prevent cloud costs from overtaking the benefits of the cloud (Maklouf, 2020).

## **Optimize services and exploit cloud infrastructure**

An interesting take on the vendor lock-in implied a less conventional mindset to grasp its utility. As opposed to perceiving high asset specificity as a dependence mechanism with high risk, another perception sees the lock-in as a way to cement into a system and optimizing services. By engaging with a provider long-term, organizations may learn from those experiences and capitalize on continuous optimized services. These thinking methods require organizations to discard the propensity to maximize their own needs and instead thinking of business as an ecosystem where all stakeholders cooperate to create added value. IT requires an unconditional investment from the organization transitioning to the cloud, and in return, alleviate transaction costs by turning the notion of vendor lock-in upside down. Building on the argument above, an organization may also lessen the vendor lock-in problem by exploiting the cloud infrastructure, as was exemplified in an interview with an organization being cost independent from Amazon Web Services by designing their infrastructure according to the cloud infrastructure adopted. By taking advantage of existing infrastructure, organizations gain more independence and reduce transaction costs. Again, this implies that appropriate expertise is available to the organization.

This finding was absent in the literature review and demanded more research.

### *5.1.3.2. Trust*

## **Technology**

A first step to reducing transaction costs incurred through cloud computing solutions was trusting that the technology would serve its purpose and provide the benefits expected by organizations adopting it. Looking past objections and fear of technology, improving or disrupting conventional working methods, and trusting in the capabilities it delivers are critical to succeeding in using cloud solutions. It is easier in theory, but organizations who transition to the cloud must acknowledge that fear is legitimate but still an obstacle and learn from what experiences teach them by embodying it through technological innovation.

This finding was nuanced in the literature, with trust being an obstacle to overcome due to the present security liabilities of the cloud.

End-users evaluate the trustworthiness of service in the cloud computing adoption decision making, and continuous use of CC is dependent on the quality of experience compared to expectations (Sharma, Gupta, Acharya, 2020). The cloud could be considered a double-edged sword. On the one hand, its openness and

sharing nature enable connectivity and ease of use. On the other hand, it paves the way for security liabilities, a significant challenge in the cloud paradigm. It is an interesting argument since data is stored remotely on someone else's servers, thus relieving the data owner of control. Trust is truly relevant in cloud computing, making security and confidentiality a significant issue. Thus, potentially inhibiting the adoption of cloud computing (Birje, Challagidad, Goudar, Tapale, 2017).

### **Partner and their IT capabilities**

A key finding was still the recommendation to trust partners and their IT capabilities. Reducing transaction costs may be challenging as they can be formal and informal, directly and indirectly, connected to the transaction in question. One way to alleviate them relates to the notion of relational governance. Nurture a mutual relationship based on trust. Embrace the idea that a partner possesses IT capabilities and knows how to apply them with the organization's best interest in mind. It is plausible through a long-term relationship with a devoted partner to its clients. It is not some eat, pray, love methodology, rather a recognition of the partner's ability to support and advise the organization transitioning to the cloud. In highly competitive markets, the risk of opportunistic behavior, information asymmetry makes it challenging to embrace trust. Nonetheless, the benefits seem to outweigh the pitfalls.

This finding was nuanced in the literature, stating that trust was essential but still a significant hurdle for organizations due to lack of transparency.

There is a lack of transparency related to licenses impacting customers' willingness to enter a contract (Nieuwenhuis, Ehrenhard, Prause, 2018). However, trustworthiness is paramount when assessing vendors' features since the client is dependent on the vendor when choosing their service (Wulf, Westner, Strahringer, 2020).

### **National disparities**

The notion of trust seemed to be a victim of geographical disparities. Scandinavian countries exhibit a higher level of trust than other countries. As iterated by Interviewee A, it might prove more challenging in other countries with different cultural beliefs, habitus, and business philosophies. Trust implies responsibility, accountability, autonomy, empowerment, and collaboration, which surely mitigate transaction costs and create added value. Thus, organizations engaging with providers may use this knowledge to modulate their approach to vendors and use the degree of trust to regulate their relationship accordingly. However, this notion is still a significant obstacle to assess.

This finding was consistent with existing literature validating the power of trust relative to context.

Lack of trust and trustworthiness is considered a significant challenge. Therefore, organizations need to assess these variables concerning their respective organizations, market, and other contextual factors (Akbar, Shameem, Mahmood, Alsanad; Gumei 2020). Political, cultural, and environmental conditions have variable implications for willingness to trust (Prajapati, Kant, Tripathi, 2020).

### 5.1.3.3. *Loss of control*

#### **Historical significance and authority**

In industrial times, traditional organizations were hierarchical and centralized with a high degree of rigidity. The modern organization has a less centralized structure consisting of autonomous cross-collaborating teams with increased agility and responsiveness. This shift has challenged authority, and the same could be said to the IT people now relinquishing part of their technology to providers. However, the key take-out is to let go of the ego and understand that cloud solutions' immense complexity. Collaborating with external partners is only beneficial and can enable more control if one is patient and collaborative, able and willing to separate people from the problem. As individuals generally like to be the masters of their houses and backyards, relinquishing control to somebody else might be uprooting for many. However, history teaches us that resistance and loss of control endure but mostly loses to change. As was expressed in an interview, electricity endured the same opposition and still weaved itself into the fabric of society. It is a clear reminder that organizations should acknowledge that they cannot control everything and trust the processes put in place by cloud technology.

The anecdote of water significance existed in the literature.

According to the National Institute of Standards and Technology Cloud Computing Standard Roadmap (2013), Cloud technology is conveyed the same amount of significance as water and electricity. Thus concretely demonstrating the importance of this technology, its functions, and benefits (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

#### **God mode**

Another exciting finding nuanced the notion of loss of control. Contrary to what initially thought, access to cloud computing solutions comes with boundless control if not regulated and audited. Grasping the ramification of the power of the cloud is critical for organizations playing with this technology as it wields forces far more reaching than initially anticipated by many companies. One could say the loss of control entailed by outsourcing to the cloud loses to the notion of “god mode” access to cloud solutions brings about. This finding was absent from extant literature. Thus, an interesting area of research.

### 5.1.3.4. *Choosing the right provider*

#### **Relational governance**

An obvious remedy to reducing unprecedented costs occurring in a cloud transition was choosing the right provider. However, it is probably easier on paper than in practice. Thus, finding a partner interested in supporting the organization's transformation into the cloud instead of just onboarding them as a punctual transaction and letting them at the mercy of customer service is critical. Nevertheless, a cloud journey may be prosperous if the customer service department is entirely devoted and not overworked, thus constructing meaningful relationships with customers.

These findings were in accordance with extant literature.

Research states that strategic use of information technology to exploit relational opportunities enables increased strategic and operational advantages. Frequent collaboration might alleviate transaction risk by reinforcing social capital and organizational reciprocity by requiring each party to trust each other to a certain extent. Organizations need to work extensively to minimize transaction risk and reap trustworthy partnerships (Schniederjans, Hales, 2016).

Furthermore, hidden costs such as additional control and coordination mechanisms or re-sourcing efforts after contract expiration may compromise ITO success, especially for customers. Thus, contract type influences risk exposure and profitability (Könning, Westner, Strahringer, 2019). Organizations who manage to focus on nurturing high-quality relationships through the way of delivering products or services and how ideas convey to customers may tend to look for alternative ways to achieve those goals. Thus, harnessing the power of innovation that could translate into a source of competitive advantage (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

### **Assessing quality stamp**

There were several alternatives to attain a healthy relationship with a provider. Once again, the organization's responsibility was to do the proper research. Evaluating the provider and assessing the quality of their actions is a way to secure the proper one. With the number of actors in the market, it becomes inherent to ensure partners who value quality as much if not more than the customer. A quality stamp is critical for a long-term relationship to get it right from the get-go.

This finding did not appear in the literature review and requires more research.

### **Compatibility**

Moreover, organizations should find partners compatible with their business needs and expectations in a business relationship. It is not juxtaposed with finding a partner that complies unconditionally, does not challenge or criticize, but strategically aligns with their customers.

This finding was consistent with extant literature.

Organizations should use cloud computing solutions according to their current infrastructure, equipment, and existing systems to facilitate smooth deployment. Therefore, assessing compatibility is crucial (Amron, Ibrahim, Abu Bakar, Chuprat, 2019).

Decision-making related to cloud outsourcing software development indicated that compatibility issues were critical to consider, followed by hidden cost, intellectual property protection issues, incongruence between IT and business goals, and operational and transaction risk (Akbar, Shameem, Mahmood, Alsanad; Gumei 2020). Compatibility is a critical enabler that attracts organizations to transition to the cloud. IT has an influential impact on the IT switching process by delineating insights relevant for a successful transitioning. Especially since some cloud deployment models enable integrating legacy systems into cloud infrastructure at different levels. Hence, system compatibility is critical for accepting that a given cloud structure aligns with business needs (Bian, Kang, Zhao, 2020).

## **Communication**

Communication was critical to secure a fruitful relationship and engage in sound, objective discussions about business problems and solve them. It conveys directives internally to cooperate with colleagues and externally to partners for expectations, goals, conditions, and possible limitations or foreseeable challenges. Clear and constructive communication incites transparency, willingness to cooperate, and alleviates information asymmetry, thus reduces transaction costs.

This finding appeared in the literature review less than what probably exists in extant literature.

Open communication is critical across the organization, including external parties such as customers and partners (Finney, Corbett, 2007).

## **Beware of exiting penalties**

Another hidden cost that deserved an honorable mention was the notion of exit costs. These exiting penalties most probably figure in the Service Level Agreements, but not necessarily something organizations consider when assessing their readiness to go cloud or select a provider. This knowledge may come across as a prevention measure for changing providers but more beneficial if seen as an incentive to carefully locate and lock on a cloud provider. As many organizations emphasize costs, this prevention idea seems to be a proper psychological mechanism, especially for the more risk-averse organizations.

This finding was absent from the literature review but is an interesting area of research.

### *5.1.3.5. Externalities*

## **Regulatory concerns**

An exciting finding pertained to how regulations may constrain cloud computing technology. Therefore, an organization engaging with the technology is wise to consider this when transitioning to the cloud. Multiple cases occurred in this study. The GDPR and anti-trust regulations came up as regional constraints that might affect organizations differently. With the evolution of the cloud paradigm, it seems reasonable to assume regulatory ramifications will evolve accordingly. Thus, knowledge about this notion seems highly relevant and critical for a pertinent cloud journey.

This finding was coherent with observations in the literature.

Extant research asserted that data in the cloud might engender compliance issues with laws such as the famous Sarbanes-Oxley Act, the Health Insurance Portability and Accountability Act (HIPAA), or the Cloud Service Level Agreement Standardization Guidelines by the EU Commission (Khalil, Winkler, Xiao, 2017).

Moreover, according to a model developed by International Data Corporation (IDC), the cloud computing market may grow more strongly if obstacles to CC within the framework of the economic analysis of the European Union (EU) cloud computing market are removed. It claimed that in the absence of interference, cloud computing would contribute 88 billion euros to the EU economy in 2020 and 357 billion euros in 2015-2020 (Cengiz, Bakirtas, 2020). Research states a lack of consensus on privacy laws on a global basis. Thus it is critical to provide self-protection assurances to facilitate end-users control over personal and sensitive information going forward. A proposition involved instigating measures prompting autonomy,

competency, security, perception of control, and providing access to choices to strengthen the management of personal information (Li, Chang, Wang, 2020).

### **Public versus private sector expectations and appropriate fit**

There seemed to be a discrepancy between the expectations of organizations and appropriate fit according to their needs. For anyone having worked with sales, this is a recurrent theme. It has two facets. The first one pertains to a discrepancy between expected need and actual need. The second pertains to externalities such as regulations hindering a proper transaction. Specifically, the public sector characterized by a high degree of formalization hinders the appropriate integration of cloud solutions for their organizations. The public sector has various challenges concerning regulations and readiness assessment.

This finding appeared in extant literature.

The United States Federal Government integrated cloud computing across agencies. President Obama and Chief Technology Officer Vivek Kundra advocated it as a tool to openly engage with citizens and foster innovation. Furthermore, according to the European Commission (EC), the public services and administration recognized cloud computing as an enabler of digital government services that can take over former functions of locally hosted IT systems. However, there were still challenges related to implementing this technology, thus the need to research such operations in a public sector setting. The U.K national government referenced the Government Cloud (G-Cloud), estimated shared services potentially leading to 3,2 billion pounds in saving from transitioning to the cloud. However, there were concerns around hurdles impeding appropriate usage of cloud solutions such as standards, certifications, data protection, interoperability, lock-in, and legal uncertainty (Jones, Irani, Sivarajah, Love, 2019).

The discrepancy between expectation and the appropriate fit seemed necessary to underline. It occurs both in the private and public sectors as organizations but in different manners. In the public sector, organizations are not aware of what to ask for and how to ask the correct inquiries. It is much easier to engage in conversations with providers in the private sector. But in this case, it seems providers must sometimes educate customers and persuade them of what they need. This knowledge is valuable as it may help organizations assess themselves and be aware of their biases when looking for a cloud solution. Being aware of these psychological anchoring mechanisms may benefit decision-makers in having more productive conversations with providers or consultants. Thus, requiring a high degree of trust and willingness to approach decision-making mindfully. With an investment as significant as going cloud, it seems vital to acquire the correct solution from the right provider according to organizational needs and objectives, thus being aware of own biases might facilitate that decision. In addition, understanding the uncertainties and complexities of today's market is a good start place for mitigating transaction costs.

The last critical success factor related to the construct of technology presented in the following subchapter.

## 5.1.4. Technology

### 5.1.4.1. *Modernizing IT*

#### **Tradeoffs**

A significant finding was the value of understanding the tradeoffs of transitioning to the cloud. Acknowledging certain truths is inherent to use the technology correctly. It implies acceptance and trust in the technology. Such tradeoffs are relevant from multiple facets. The cost of going cloud is variable in the process of transitioning. Failure to commit comes with an incurred cost and fewer benefits. Reluctance from investing in expertise, whether consultants, talent management, or additional training for employees, comes with operational and security liabilities that may have long-term consequences. Ignoring good research, preparation, and assessment for the cloud journey may have detrimental repercussions. Engaging with the cloud implies information sharing. Such realities are critical for organizations to enjoy a good cloud experience.

This finding was consistent with extant literature.

Beneficial use of cloud computing comes with tradeoffs, such as relinquishing sensitive information to cloud providers. A prerequisite for a cloud to process user queries and return information efficiently is access to that information. Thus, raising potential concerns regarding cloud security and information leakage (Liu, Tan, Wu, Wang, 2012). Moreover, a tradeoff exists between implementation time, cost, and functionality of cloud solutions. Accepting standardized cloud solutions may lead to shorter implementation time but not align with organizational needs. Nonetheless, empirical evidence on SaaS implementations shows that organizations accept this standardization for fast and less expensive cloud solutions. Moreover, cloud providers may help customers reach their needs and eliminate unnecessary features by sharing best practices and experiences to positively influence their needs (Fuzes, 2018).

Finally, organizations should adjust their degree of outsourcing relevant to their strategic goals. There is a tradeoff between efficiency and adaptability with organization outsourcing processes reliant on emerging technologies. Hence, different goals necessitate appropriate governance structures and flexible approaches to outsourcing (Asiatini, Penttinen, Kumar, 2019). Thus, organizations need to grasp the necessity of considering weighing the benefits of cloud solutions against the barriers identified by critical success factors assessment (Sharma, Gupta, Acharya, 2020).

#### **Reallocation of capabilities**

An interesting finding related to modernizing the IT department when going cloud. With a radical new system in place, capabilities are prone to reallocation. With tedious tasks handled by the solution and more resources freed to engage with other value-creating activities, the organization becomes more effective. In line with the idea mentioned above of IT becoming business-oriented, this is an area in which capabilities could reallocate. With the hard part of IT handled by the provider, the internal expertise may engage with more modern IT capabilities such as innovation exploration, business development, data-driven experimenting, supply chain optimization, communication, marketing projects, research, and training.

This finding occurred rarely enough during the literature review.

Organizational IT capabilities need alignment with the cloud computing environment requirements it operates in (Amron, Ibrahim, Abu Bakar, Chuprat, 2019).

#### 5.1.4.2. *Legacy systems*

##### **Technology lag**

The critical phase of going cloud is to decide what to do with the legacy systems. The danger of possessing a traditional system in a market where everybody is encouraged to go cloud is that expensive legacy systems hinder a smooth transition. An interviewee described this very shrewdly by referring to the notion of technical debt. It entails the rigidity of legacy systems. The immense cost of upgrading these systems to perform well enough creates a technology lag enabling organizations to fall behind on the technological development, thus their competitors or even partners. It might present itself as an impossible situation for organizations without the financial muscles to execute such a transformation, nor the expertise to oversee its development. Hence, the importance of strategically approaching the decision to cloud source by using the cloud loop of knowledge framework to minimize the black box of innovation and incrementally transform conventional IT systems.

This finding was in line with extant literature. Nonetheless, there was abundant evidence of the challenges of transforming legacy systems, pertaining that it is not as easy in practice as in theory.

Considering the state of current legacy systems is a valuable indicator of potential issues that may have implications for technical and organizational change (Finney, Corbett, 2007). On-prem IT infrastructure is one of the biggest reasons for inflexibility in IT systems. Required IT financial resources, cost of running implementation of new hardware and software is expensive and perceived as an incentive to go cloud for business users (Fuzes, 2018). However, many organizations experience challenges with high maintenance costs of outdated legacy systems and lack the technical support available. Reduced system benefit perception, user satisfaction, and resistance may facilitate the discontinuance of the traditional system.

Nonetheless, when faced with legacy and cloud solutions, an assessment must be made between these two aspects and aligned with the business objective (Bian, Kang, Zhao, 2020). Many industrial organizations seek to transform their legacy systems to maintain market positions and enhance business agility.

However, adapting legacy to a service-oriented structure in the cloud engenders obstacles. A common approach offers enterprise applications as cloud-based services, a migration procedure that demands iterative processes in the cloud. Several methodologies have been proposed to migrate legacies but are still conceptual and lack extensive empirical validation (Pei Breivold, 2020). Specifically, implementing an IT system in large enterprises is a considerable financial challenge. Thus, resulting in on-premises solutions as a tendency (Yasiukovich, Haddara, 2020). Hence, the emergence of cloud computing has instigated issues for an organization seeking to transform legacy systems to cloud computing infrastructure (Shao, Yang, 2021).

### **Build for resiliency and business continuity**

Another critical part of modernizing the IT infrastructure related to ensuring business continuity. Having appropriate cloud solutions means building them for resiliency. It entails knowing the different components that constitute cloud technology and configuring them to serve the business from a long-term perspective. This finding did not occur in the literature review and demanded more scrutiny.

### **Rewrite software**

Being ahead on technical readiness means consistently rewriting the software to adapt to the cloud infrastructure in development and always be a step forward. As was expressed on several occasions, staying on top of the technology. With the life span of technology devices being increasingly shorter, anticipating is critical for organizations using cloud solutions. It could relate to the notion of continuously optimizing own infrastructure and processes.

This result did not occur in the literature review and also required more investigation.

### **Exploit the black box of innovation**

There is an extensive amount of empirical research on innovation. This finding complements the literature by emphasizing the importance of using innovation, putting all critical information regarding innovative capabilities, projects, plans, and frameworks ideas into one category, the so-called black box, to establish a frame of reference. It is also de facto easier to deconstruct a vast, complex process into minor parts and structure a determined path to follow to accomplish a cloud project by consolidating. This methodology might often be employed by consultancy when helping organizations implement projects. Organizations that adopt this way of thinking can take on a cloud project by making the black box of innovation as small as possible and execute on it. However, as has been evoked on several occasions, it demands determination, awareness, and commitment. As was mentioned in several interviews, innovation entails much fire-extinguishing. Applying this methodology to scan, locate, and build innovation capabilities is critical to master a cloud computing solution that is continuously developing.

This specific finding did not appear in the literature review but does relate to capability building and knowledge management.

#### *5.1.4.3. Security*

### **Shared responsibility model**

The notion of security initially claimed less relevance for the study. It is a very technical area that would not be relevant for the thesis, focusing on strategic decision-making for organizations going cloud. This proposition changed as security was expressed unequivocally by all participants as critical for any organization transitioning to the cloud. Organizations biasedly considering security the provider's responsibility is probably one of the most prominent mistakes organizations make when using cloud solutions. It's paving the way for irregularities and malicious activities to occur. The critical point is that the responsibility is split between the customer and the provider in a shared responsibility model.

An interviewee expressed that providers are responsible for the cloud, but customers are responsible for what is inside the cloud. It is an important finding because it negates organizations' disclaimer attitudes when outsourcing to the cloud.

This finding was consistent with extant literature.

Data privacy is a huge challenge for users as stored information is sensitive. Thus, organizations need to have proper governance to control access and secure their data (Amron, Ibrahim, Abu Bakar, Chuprat, 2019). Effective management of security risks is critical to understand the consequences of exposure and instigate appropriate strategies to analyze, monitor, and mitigate security liabilities.

Moreover, it enables organizations to understand the responsibilities of CSP for ensuring cloud service continuity, review IT continuity protocols and provide alternative recovery capabilities (Bounagui, Mezrioui, Hafiddi, 2019). Data security becomes a shared endeavor between the consumer and the cloud provider.

Organizations must revise the notion of trust by including external partners because resources are accessed remotely. By employing a public cloud, organizations expose a security vulnerability as the cloud provider can access the user's data. Moreover, this enables customers to compromise commonly shared resources and sensitive business data (Cengiz, Bakirtas, 2020).

### **Knowledge about the security environment**

Security knowledge is inherent as the technology is complicated and continuously developing. Just as the IT department needs to be more business-oriented, management and the organization need to be more technology-oriented and security-oriented. Security is not a product or a service. It's a philosophy and must seep throughout the organization to mitigate infiltration. Again, it implies the thought of being as strong as your weakest link and working as a synchronized unit to enforce measures. Therefore, the management's responsibility is to instigate processes to make the organizational culture revolve around security awareness.

This finding was nuanced in the literature by stating the importance of security knowledge. Still, the cloud poses many security liabilities necessitating extensive reassurances to persuade reluctant organizations.

Customers need to understand the repercussions and limitations stated in contracts, especially the challenge around the capability to monitor a heterogeneous ecosystem of cloud users without breaches occurring (Wulf, Strahringer, Westner, 2019). Although cloud computing has many beneficial facets, it exhibits challenges regarding service quality, fault tolerance, and energy consumption. These obstacles are paramount to secure healthy cloud performance (Belgacem, Baghdad-Bey, Nacer, Bouznad, 2020). Many organizations are reluctant to adopting cloud computing due to limitations such as data loss, data cleaning, account hijacking, less process control, insider attack by CSP's, lack of legal aspects, suitability, portability, and migration from one service provider to another, loss of reliability and quality of service. These limitations lead to issues involving security, interoperability, virtualization, data leakage, resource sharing, load balancing, multi-tenancy, and Service Level Agreements. Widespread adoption of cloud computing technology is impacted by security issues, affecting its importance in the cloud computing paradigm (Birje, Challagidad, Goudar, Tapale, 2017; Jyoti, Shrimali, Mishra, 2019).

## **Cooperation**

An important finding indicated that providers possess the best security measures. Thus, access to a secure environment is a viable argument for going cloud. The condition is that organizations commit to their part and cooperate with their partner, trust in the solution they have employed, and that system failures can be swiftly handled. Once again, choosing the right provider, trusting in them goes far beyond transaction cost and security issues, which may be the cornerstone of the digital era.

This finding was nuanced in the literature review and is subject to future research. Literature states that Cloud Service Providers (CSP) possess superior security but have yet to persuade all users and overcome security hinders.

Security could hinder cloud implementation in enterprises due to the vast uncertainty about efficient security handling at all organizations' levels. These security liabilities pose a threat to cloud computing and its reputation. There is a need to design efficient solutions to address security issues such as data transfer, long-term viability, compromised services, regulatory compliance, and virtualization in the cloud computing paradigm (Birje, Challagidad, Goudar, Tapale, 2017). Nonetheless, cloud service users access vanguard security technology from the forefront within hardware and software. Therefore, big CSPs use security as a differentiating factor in attaining economies of scale. They possess idiosyncratic knowledge related to security, remote access by mobile devices, and continuous support service availability (Wulf, Strahringer, Westner, 2019). But, the backside of the medallion for cloud technology is its proneness to cyberattacks due to shared data storage among users. An impactful attack may incur extensive losses for many cloud service customers (Sharma, Gupta, Acharya, 2020). Empirical findings indicate that most organizations retain software development data confidential as data in the cloud might be easily exposed and compromised (Akbar, Khan, Mahmood, Alsanad, Gumai, 2020). One might assume the impact of Covid-19 to change this inclination, an exciting area of future research.

## **Knowledge and mindfulness**

With the number of security breaches occurring daily, not evaluating and integrating security into a cloud assessment would be detrimental. With only a selected handful exposed in public media and the hysteria that causes, one can only imagine the consequence of the organizations knowing about all the breaches occurring in our society. As was expressed in an interview: If a group of 100 excellent IT guys woke up one morning evil, they could destroy the whole world. This grim saying is not meant to instigate fear; instead, it illustrates the importance of approaching cloud computing or any technology for that matter with mindfulness and constructive knowledge. Therefore, it is inherent that organizations cooperate with their partners to gain that expertise and ensure it embodies throughout the organization. As was expressed in another interview, the providers must educate the weakest link. If organizations acknowledge they are the weakest link, not meaning they are incapable, they will profit from immense security knowledge and, by default, a better relationship with their partner.

This finding did appear in the literature review but demands more research.

According to research, the human factor represents the most significant liability to security given the threat of social engineering (Wulf, Strahringer, Westner, 2019).

### **Mitigation measures**

With society getting more digitized and cloudy by the day, it seems reasonable to assume that security liabilities will increase in importance accordingly. Thus, mitigation measures are a viable strategy to cope with this insecurity. It could encompass the organizational processes of multi-factor authentication, educating employees not to leave their screen unattended, and not turning off the Virtual Private Network (VPN) when working. To more complex measures such as restricting and controlling access, revolving organizational processes around security measures, cooperation with IT security firms, to the more extreme of asking outsiders to hack into your organization and then patch. The idea is to be proactive rather than reactive. Prepare for the worst and hope for the best. As was expressed by interviewees, it's not a matter of if but when you get attacked. If government institutions, the biggest corporations, and cloud providers worldwide can get hacked, what in the cloud makes ordinary organizations think they will not? Ignorance? Arrogance? Stress? Those are bad excuses for not caring about the security and the future of the organizations transitioning to the cloud. Awareness, mindfulness, and willingness have the price tag of zero. Thus, security is considered critical for success in the cloud journey.

This finding did not appear in the literature review but necessitates empirical study.

The study revealed an extensive amount of data. In the end, critical success factors encompass the construct of readiness, competence, transaction costs, and technology inherent for organizations to assess when transitioning to the cloud. Many findings validated in existing theory, and others were a solid foundation for further research.

Proper usage of cloud solutions engendered benefits discussed in the following chapter.

## **5.2. Benefits**

The findings were grouped into strategic, organizational, technological, economic, and discussed in this order. It seemed relevant as strategic benefits were the most obvious and the economic benefits more subtle. However, these benefits may overlap, interplay, and generate synergy effects when combined beyond the scope of this thesis. Findings indicated clear benefits from using cloud computing technology. Strategic benefits rose as the most influential pertaining to gaining competitive advantage, access to markets, cutting edge technology, and immense innovation capabilities. However, there was an observation of a certain complexity of discerning benefits, some more subtle than others. Even though the benefits were categorized into strategic, organizational, technological, and economic aspects, they may overlap and influence each other. It might explain the difficulty in clearly defining strategic benefits without mentioning the other categories. The complexity in discerning benefits did not mean it was impossible to delineate any.

### 5.2.1. Strategic

#### **Speed**

A recurrent finding was that the cloud-enabled organizations with the capability of speed. An attribute specifically relevant in today's market where products and services need to be delivered as fast as possible. Speed reduces time to market but also enables leaner organizational processes. With that comes the ability to spot and readjust in case of anomalies. Thus, speed affects in all directions. The current pandemic has only accentuated the need for speed, demonstrating the disrupting impact of unforeseen events and its requirement to adapt faster to cope with the volatile business climate organizations operate.

These claims corroborated in the literature.

Organizations that outsource expect increased speed of delivery due to the number of resources a service provider can devote to the execution of a task (Asiatini, Penttinen, Kumar, 2019). Technology has disrupted the way organizations need to assess technology adoption regarding reaching strategic goals. Speed of performance, ease, and access to tools are considered critical success factors for success and achieving competitive advantage. Cloud computing provides cloud resources, services, and activities. It enables organizations to satisfy these success factors and be competitive (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

#### **Agility**

Flexibility to adjust and adapt according to the environment is connected to speed but goes beyond that. In addition to being fast, organizations reap the benefits of liberating themselves from rigidity and possess attributes to face environmental changes. It spans the business environment, as Covid-19 has demonstrated. There are plenty of contemporary examples of businesses without cloud solutions, nor ready or competent enough to use the technology, struggle to cope and regain their position today, let alone seize, retain, and exploit any advantage.

This finding was consistent with the literature but nuances by stating agility did not exclude the cloud's challenges.

The cloud computing paradigm has significantly evolved by advancing sophisticated methods to derive benefits from technology. The new era of computation has shifted from device and location orientation to a distributed level. Storage capability, connectivity, and technological services have increased, paving the way for a more agile approach to computing. The focus on service-oriented computing of the cloud has received impeccable significance. Cloud computing enables communication among data centers, allocates resources over a network, and provides a holistic and efficient approach to business (Gundu, Panem, Thimmapuram, 2020). The cloud phenomenon yields affordable access to measurable, rentable, and billable computing resources. The large pool of easily usable and accessible virtualized resources may reconfigure to optimize organizational resource exploitation. Its key advantage is elasticity and flexibility. Customers can access services on demand from any location at any time. Such are the unique value propositions of the cloud. However, dynamic resource orchestration characteristics in the cloud environment do not preclude concerns

related to security, privacy, and vendor lock-in challenges (Johansson, Muhic, 2017; Belgacem, Beghdad-Bey, Nacer, Bouznad, 2020).

### **Business Process Re-engineering**

Another significant benefit was the opportunity to reconfigure business processes. Using the cloud infrastructure and its intelligence, organizations can improve and automate their business processes, rendering the organization more efficient. Moreover, this is not a punctual definite process but can continuously evolve, making the organization incrementally better, which has repercussions internally and externally.

This finding was consistent with extant literature, pointing out the leveling of the competitive field.

Cloud computing shifts IT functions in organizations from constructing their systems to utilizing IT as a service by outsourcing to providers, thus reconfiguring business processes and facilitating sources of competitive advantage. However, the prerequisite is strategic alignment between IT and business (Fuzes, 2018). In addition, project management concepts have transformed into a more agile form more compatible with the rapid implementation of cloud-based enterprise solutions (Nieuwenhuis, Ehrenhard, Prause, 2018). Cloud computing engenders integrated management of business processes with the potential of technical and strategic added value creation for Small and Medium Enterprises (SME) (Yasiukovich, Haddara, 2020). Thus, cloud computing has leveled the field of technological entry barriers and increased the competitiveness of SMEs (Bouaynaya, 2020).

### **Focus on core competency**

An obvious benefit from using cloud solutions, also at the core of any outsourcing initiative, was focusing on core strengths and operations. Thus, freeing up resources and redirecting them towards core objectives. It makes organizations more efficient and probably more competitive.

This finding which is the cornerstone of outsourcing theory, was validated in extant literature.

Outsourcing enables organizations to focus their attention on core operations (Sharma, Gupta, Acharya, 2020). Focusing on core business capabilities increases organizational productivity, impacting operational and financial performance (Khayer, Bao, Nguyen, 2020). Organizations may effectively employ outsourcing by leveraging critical success factors, associating them with its performance outcomes to gain benefits, and creating value from specific activities instead of focusing on non-core activities. Thus, generating more flexibility, agility and facilitating fixed costs to variable costs, rendering the company more adaptable (Prajapati, Kant, Tripathi, 2020).

### **Don't run servers on-premise**

This finding was probably where marketing slides and reality aligned the most. The investment savings of not running servers in the basement or the kitchen is a clear strategic advantage that enables organizations to redirect those financial resources to other areas and provide the elasticity to install and operate a business efficiently with little constraints.

This finding was consistent with extant theory with a nuance for SaaS limiting user's customization capabilities.

Flexibility in organizational IT infrastructure is beneficial to deliver services faster, optimize administrative processes, improve knowledge exchange and process alignment across the company. Such flexibility may also enable rapid implementation of information technology, thereby being more adaptable to opportunities, threats, and possibilities (Liu, Tan, Wu, Wang, 2012). Using cloud solutions enables a more flexible IT system to scale up and down and respond to changing business needs, thus improving strategic alignment. However, in the case of SaaS, standardization limits customization to a certain extent for business users, which forces organizations to accept standardized cloud structures (Fuzes, 2018). Nonetheless, scalability enables organizations with flexibility and minimum investment tailored to their resource consumption. Thereby facilitating more amenable disaster recovery and providing excessive business speed through the capability to handle huge workloads and demanding data traffic more efficiently (Akbar, Khan, Mahmood, Alsanad, Gumai, 2020).

### **Competitive advantage**

The benefits mentioned above empower organizations with a competitive advantage, especially for organizations either lagging in technology or sitting on the fence. It seems strange to classify cloud computing as a competitive advantage with everybody going cloud. As was expressed in an interview, even the finance industry and governmental institutions, which were the most reluctant to engage, are now the frontrunners of this technology, clearly advocating the benefits of going cloud. It may not be a sustainable one, but an edge nonetheless.

This finding occurred in extant literature to a vast extent.

Cloud computing allows for increased elasticity, scalability, shared resources, pay per use consumption, and shared environment permitting economic and flexible IT solutions that organizations may exploit to attain operational and strategic agility when facing complex and dynamic business climate (Liu, Tan, Wu, Wang, 2012). Cloud sourcing is a reliable paradigm, and even reluctant organizations have increasingly relinquished their skepticism and traded it for adoption to preserve competitive advantage in the market (Johansson, Muhic, 2017). Furthermore, cloud-based information management is considered a prominent differentiation strategy for organizations. As the business environment is ever-changing, information technology capabilities in cloud solutions are critical to support organizational processes and appropriate value to ensure competitive advantage. For organizations to derive strategic benefits from cloud solutions, they need to deploy resources effectively and leverage them to develop cloud computing service models to attain business benefits (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018).

Cloud computing has disrupted business models offering Information as a Service instead of IT as a product. Without renouncing service level agreements (SLA), immense savings related to data centers are a clear competitive advantage incentive for data center operators economically and environmentally (Sharma, Gupta, Acharya, 2020). Moreover, cloud technologies are excellent sources of competitive advantage for supply chain operations in organizations as they enable partners' integration (Shao, Yang, 2021).

## **Best practices from providers and innovation capabilities**

The advantage of using a cloud solution, given that one chooses a proper one, is that the providers have invested heavily in the technology over time. Experiential learning enables them to suggest best practices to organizations to implement. It may be a considerable benefit in several aspects. First, it provides a proof of concept. Second, it saves resources both in terms of experimenting and investing. Third, it is a testament to the devotion of the provider, thus providing a quality stamp potentially confirming the choice of the right provider. Fourth, this reassurance increases trust, consolidates the relationship. Using cloud computing solutions equips organizations with innovation capabilities they may exploit to reposition from capturing value to creating value. Given the propensity to learn about the technology and how it benefits the organization, they may utilize it to restructure their interior lines to reconfigure the organization as a whole, be on top of technology, anticipate, and deliver innovative services to their customers. Hence cementing their position in the market by creating value both internally and externally. However, this requires the knowledge, passion, and commitment to integrate cloud technology into the organization and fuse it with existing methods. There might be critical hindrances to overcome and trenches to dig, but the benefits are immense on the operational, tactical, and strategic levels.

This finding was consistent with existing research.

Cloud-enabled capabilities include infrastructure flexibility and integration (Liu, Chan, Yang, Niu, 2018). Also, cloud computing is considered a driving force of corporate productivity and a platform for entrepreneurship (Cengiz, Bakirtas, 2020). Thus, cloud computing may improve technology capabilities via technology absorption capabilities (Shao, Yang, 2021).

The strategic benefits of cloud computing are present given proper usage. More tangible benefits emerged at the organizational level in the following subchapter.

### **5.2.2. Organizational**

#### **Usability**

The usability of a cloud solution permitted users to interact with the technology. The more usable, the higher propensity to use. With the frequency of interaction increasing, the more users familiarize themselves with the technology, the better chance to transform that experience into organizational processes. In addition, frequent interaction reduces stress and mitigates inertia. Lastly, regular use also increases the likelihood of discovering anomalies or areas of improvement. Thus usability of cloud solutions engenders clear advantages for operational efficiency.

This finding was somewhat nuanced in the literature.

Usability is critical for cost reduction for organizations transitioning to the cloud as labor-related expenses improve the quality of services and products. However, NIST has described usability as an area of concern in their Cloud Usability Framework. Issues regarding adopting cloud capabilities to cloud consumers' expectations, user interface and experience, the system's performance under given conditions, security, and

return on investment for users investigate and underline the importance of usability for services delivered over the Internet (Buyya, Srirama, Casale, Calheiros, Simmhan, Varghese, ... & Shen, 2018).

Nonetheless, extant research reveals a positive relationship between the utilization of cloud solutions and organizational performance, such as flexibility and quality of services (Khayer, Bao, Nguyen, 2020).

### **Ease of use**

Ease of use differentiates from usability by determining how easy the solution is to use. A clear benefit from cloud solutions is that web interfaces are constructed to deploy the organization's technology easily. Ease of use is beneficial for several reasons. It enables end-users to quickly get acquainted with the technology, thus mitigating technology stress, alleviating organizational inertia. Moreover, it facilitates collaboration and knowledge sharing internally and externally. It also makes the organization more effective and willing to work with novel working methodologies in the future.

This finding was somewhat found in the literature and perhaps more critical in the current context of the pandemic more than ever.

Organizations' willingness to accept technology is contingent on their capability to execute tasks faster and more efficiently (Amron, Ibrahim, Abu Bakar, Chuprat, 2019).

The pandemic Sars-Cov-2 ravaging the midst of our societies engendered immense repercussions such as physical lockdown of educational instances, prompting to shift from an “on-premises” model to an “online-only” approach. With the absence of physical presence and social distancing, digital learning and communication platforms' perceived usability is an influential aspect of keeping the wheels turning (Pal, Vanija, 2020).

### **Data-enabled decision making**

Access to data generated by cloud solutions enabled organizations to gather and synthesize valuable information for decision-making. Again, data transparency can be exploited internally as a transparent communication channel between employees and managers, but also for and among themselves. Also externally to track business processes, whether logistics or sales and marketing cycles with customers and partners. It facilitates collaboration across departments.

This finding appeared in the literature.

Technology enables access to data that may engender more accurate forecasting, improving transparency and decision-making, and focusing on critical activities (Aydiner, Tatoglu, Bayraktar, Zaim, 2019).

### **Collaboration**

Cloud solutions enabled collaboration because everybody has access to the same system. This homogenous access removes friction between individuals at all layers of the organization, thus permits everybody to work together in the same direction. It is beneficial for several reasons. First, it removes any interoperability issues caused by using different system architecture. Of course, different departments may use other parts of the solution, such as Enterprise Resource Planning (ERP) or Customer Relationship Management tools, but they integrate into a shared infrastructure. Second, it reduces the margin of error. Third, it aligns the organization as a whole and clusters organizations.

This finding was consistent with extant literature.

Cloud computing usage has shifted IT's role to align with the business. By outsourcing tedious tasks, reallocating capabilities, and ensuring IT has proper coordination responsibilities, the department may focus more on business needs and assume the strategic partner's role (Fuzes, 2018). Flexibility in the IT infrastructure ensures data consistency, universal connectivity, shared information, and cross-functional application integration. It might strengthen connectivity internally across departments and externally towards customers and partners. It makes collaboration easier across the value chain (Liu, Chan, Yang, Niu, 2018). Moreover, a critical success factor induced by PaaS and IaaS interoperability is the ability for SMEs to collaborate and compete against the big players. Consequently, organizations will favor migrating legacy systems or adopt cloud technology (Bouzerzour, Ghazouani, Slimai, 2020).

### **Knowledge sharing**

Knowledge sharing has never been easier than with cloud solutions. As was expressed in an interview, Covid-19 accelerated the need for document and knowledge sharing. This example clearly illustrates the power of the cloud enabling access to information regardless of geographical or time boundaries. Moreover, a typical system makes it easier to store data and access it, in turn, easier to diffuse it. As was mentioned in an interview, virtualization makes the user hardware irrelevant.

This finding was consistent with extant literature. It also underlined knowledge sharing spanning organizational boundaries.

Cloud solutions facilitate information sharing by simultaneously working on a project and collaborating in novel working methods. Thus, organizations gain access to the same cloud resources (Liu, Chan, Yang, Niu, 2018). It permits organizations to invest in virtual storage technology, thereby manage and share data in an agile, scalable, and cost-saving manner (Amron, Ibrahim, Abu Bakar, Chuprat, 2019).

Furthermore, the more aligned an enterprise is across departments, the more it engages in information integration and knowledge sharing, with a higher probability of employing cloud technology to absorb knowledge externally from the ecosystem in which it operates (Shao, Yang, 2021).

### **Leaner business processes**

Organizations who use the cloud gained the ability to build leaner business processes. By exploiting the system intelligence, organizations can integrate this into processes to make them more effective and increase efficiency. Consequently, processes can continuously be optimized to find working strategies beneficial for the organization.

This finding was nuanced in the literature, with cloud facilitating the emergence of shadow IT activities. Cloud computing strengthens the external relationship and optimized internal relationships as information may be privatized in the cloud for communication cost-effectively and efficiently without compromising security liabilities (Schniederjans, Hales, 2016). Cloud solutions may influence organizations' ability to manage information systems, share and store data, detect opportunities and threats (Garrison, Rebman, Kim, 2018).

However, Organizations purchasing a SaaS such as ERP, Human Capital Management, recruitment, or marketing solutions become more effective. They empower business users to convey their needs and engage in conversations with the provider who possesses expert power related to the cloud. Thus, enabling organizations to bypass, to some extent, their own IT department and access business applications faster through the provider.

Cloud computing solutions may pose a challenge for the IT departments as well. IT may experience coordination of different systems in the organizations using several systems that they cannot control anymore. As various systems are purchased without the oversight of IT, this may facilitate the emergence of shadow IT, thus increasing the probability of data loss or exposure of confidential information. Without proper coordination between departments, the company's enterprise architecture may degenerate and impact daily operations. Hence the importance of incorporating IT into the organization's governance structure serving as the glue (Fuzes, 2018). As called in an interview, credit card ninjas users ordering cloud services are considered a threat to organizational efficiency.

Nonetheless, cloud-based information systems permit a more granular division of tasks between the outsourcing service provider and its customer, broadening the scope of alternatives for business process organizing (Asiatini, Penttinen, Kumar, 2019). Moreover, there is consensus that talent management may strengthen employee retention, and exploiting technology in a business environment may reduce business costs. Thus cloud computing can serve as a tool to manage talents and maintain competitiveness (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

### **Leadership tool**

The Human Resources technology case was a clear example of how cloud solutions may serve as a leadership tool. Access to information increases oversight, and systematization of information benefits on several levels as it serves as an indirect control mechanism for the leader. The leader gains access to valuable information for monitoring, auditing, and process control. This oversight enables leaders to understand where to intervene and facilitate autonomy. It also makes it easier to configure the organization and align them by inspiring and empowering them.

This finding occurred in the literature in a management context.

IT leadership or opinion leaders with expert power on cloud solutions may positively impact users' willingness to continuously adapt and use the technology despite liabilities related to privacy and security risks. IT leadership and trust also influence attitudes, intentions, and perceptions of cloud solutions usage by openly sharing cloud information and stimulate conformity (Garrison, Rebman, Kim, 2018).

### **Data analytics for transparency and effectiveness**

Cloud solutions generate a vast amount of data that organizations may use for decision-making. Being available on a standard platform makes it more accessible and transparent. Transparency is beneficial because it nurtures honesty, trust, and objectivism, intangible forces that make the organization more effective when harnessed.

This finding was consistent with the extant theory.

Business Intelligence and Analytics leveraged by cloud computing may facilitate better information processing and enabling managers to make better business decisions and understand what their organizations deliver (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018).

Human resource strategy, human resource planning, recruitment and selection, training and development, performance management, compensation, and career path planning are vital areas highly compatible with cloud computing (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

### **Resource savings**

A key benefit of going cloud was saving resources on various levels. Being able to alleviate initial hardware investment is a big financial saving in itself. Going cloud reconfigures IT capabilities by freeing resources that can reallocate, pertaining to the farming example. The shepherd may assume other responsibilities when the cattle change location. It can be nuanced by either reallocating or terminating employment. One can dig even more profoundly and claim that cloud solutions' effectiveness in performing tasks may help scan and localize resources detrimental to the organization and extract them. The immense benefits of a healthy organizational culture are contingent on proper resources. Toxic resources can cause more long-term damage than several good ones can produce advantages. Thus the use of neutralizing such liabilities is valuable. Possessing the right skills and the right people is imminent for the organization.

This finding occurred in extant literature in settings spanning organizational benefits.

Cloud solutions impact IT in the organization through profit or cost centers, impacting market structure, organizational profitability, and consumer welfare (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018). Moreover, organizations engaging in corporate social responsibility may reduce their carbon footprint and benefit from efficient cloud computing solutions. As vendors assume various roles such as infrastructure, platform, application, and license provider, it alters their business models, and, with it, the cash flow shifts from short-term into a long-term stream (Nieuwenhuis, Ehrenhard, Prause, 2018). Furthermore, cloud computing adoption has an impactful input effect on business performance. Organizations benefit from no initial investment, maintenance reduction, energy consumption, personnel cost, increased computing power, scalability, and flexibility (Cengiz, Bakirtas, 2020). The technology also provides global virtual accessibility of data and resources on-demand (Akbar, Khan, Mahmood, Alsanad, Gumai (2020).

Finally, the pay-as-you-go model enables cloud computing solutions to adjust the usage of IT resources according to needs (Khayer, Bao, Nguyen, 2020).

### **Use of customer feedback**

An important finding, which is probably commonly used in business, was cloud solutions' ability to use customer feedback. There are immense benefits in gathering and exploiting user experiences to enable organizations to deliver improved services to the customer. The right way may prove an endless cycle of innovative ideas that might increase customer satisfaction and retain customers. Of course, feedback needs assessment, but just as customers don't necessarily know what the appropriate solution is for them, the organization may not know how to anticipate the best solution moving forward. By interacting with the customers, voicing their concerns and suggestions, the organization may tap into a free source of innovation.

It's a win-win for all parties as organizations gain knowledge and innovative ideas that may transform into value creation. Customers feel empowered by being heard and taking part in the creation.

This finding occurred in the literature, but more cloud-specific research is needed.

In information technology systems, knowledge management systems are an influential addition to the customer journey by supporting the customer cycle (Elbahri, Al-Sanjary. Ali, Naif, Ibrahim, Mohammed, 2019).

### 5.2.3. Technological

#### **Eliminate the need for hardware**

Transitioning to the cloud eliminated the need to invest in hardware in general. As was expressed in an interview, the cloud removes IT's tricky part. The savings can be reinvested into other decisive parts of the organization. The lack of hardware and virtualization facilitates mobility and flexibility, enabling all organizations to go cloud as long as they have an internet connection and means to pay for consumption. This technological revolution is a substantial benefit that spans technical advantages.

This finding was consistent with extant literature.

Cloud computing alleviates infrastructure costs and system maintenance (Mei, Li, Li, 2017). When organizations outsource to the cloud, IT departments are relieved of acquiring and installing hardware, operating systems, databases, and middleware. IT then assumes the role of crucial client for the organization with the provider (Fuzes, 2018). The SaaS methodology exhibits many benefits specifically related to cost management than other software system categories. Providers license a service package on-demand, enabling organizations to refrain from investing heavily in hardware and software, solving a significant challenge for small businesses who may acquire a network-based system to handle transactions and planning process (Elbahri, Al-Sanjary. Ali, Naif, Ibrahim, Mohammed, 2019). Thus, organizations may surmount IT complexity by transitioning from a traditional to an on-demand model (Bounagui, Mezrioui, Hafiddi, 2019). Furthermore, unexpected peaks in computational demands do not compromise service level agreements because of on-premise infrastructure inaptitude to deliver the expected quality of service. The lack of necessity to invest heavily in hardware enables organic growth and only pays for consumed resources (Buyya, Srirama, Casale, Calheiros, Simmhan, Varghese, ... & Shen, 2018). Also, data migration reduces hardware-related costs such as servers, installing operating systems, databases, license costs, deployment of products, and employment of human IT resources to develop and maintain the system (Qarkakhija, 2020). Cloud computing is a source of innovation exploiting internet connectivity and enabling organizations to access a range of resources spanning both organizational and spatial boundaries, potentially facilitating productivity (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

#### **System upgrades and functionalities**

Another crucial benefit of going cloud was the access to continuous system upgrades and functionalities. As the technology develops, the subscribers to that technology benefit from those steady improvements. As was expressed in an interview, customers pay more and get a new solution in return for every update.

It enables organizations to hook themselves to experts on top of their technology and take advantage of their exploration. By default, they also stay on top of the technology and the innovation capabilities that arise.

This finding was consistent with extant literature.

Cloud solutions equip organizations with optimized IT capabilities related to IT service acquisition, implementation, flexibility for massive computation consumption, data management, and infrastructure (Kauffman, Ma, Yu 2018). Technological platforms provided by the vendor enable external parties to develop applications spanning the core functionality of the enterprise software, allowing them to distribute added value more efficiently (Nieuwenhuis, Ehrenhard, Prause, 2018). SaaS will enable organizations with inflexible IT systems to employ novel applications such as employee recruiting and management that require mandatory integration with existing ERP. IT may operate faster instead of waiting to upgrade existing systems. Thus, SaaS providers enable faster and better business solutions, which improves alignment between business needs and IT solutions supporting those needs (Fuzes, 2018). For example, Microsoft Azure has various application areas such as application development, testing, hosting, and leveraging virtualization. It may also integrate and synchronize virtual devices and directories, collect, store, and assess metrics and extend the realm of virtual machines by providing immense data storage capability (Gundu, Panem, Thimmapuram, 2020). Thereby instigating solutions for virtually any imaginable goals with unlimited opportunities (Qarkaxhija, 2020).

### **Continuously optimized solutions**

Providers continuously optimize cloud computing solutions by being on top of technological trends. It is essential for several reasons. First, it forces the system to perform at its best at all times. Second, it ensures organizational processes don't halt due to system irregularities or failures that cause friction and impede organizational productivity. Lastly, it mitigates security liabilities which may turn disastrous for the organization.

This finding was somewhat iterated in the literature but requires more investigation.

Cloud computing's synchronization and consistency capabilities engender an organizational portfolio capability that impacts business agility and performance. Thus, redefining the scope of products and services offered restructures value propositions beneficial to customers, which improves revenue streams (Kathuria, Mann, Khuntia, Saldanha, Kauffman, 2018).

### **Enhanced customer experiences**

The driving forces of cloud computing solutions allowed organizations to deliver enhanced customer experiences. It pertains to several findings mentioned, such as customer satisfaction and customer feedback. Providing superior customer experiences ensures a loyal, happy customer base that advocates services. Word of Mouth is a powerful marketing method. Organizations may exploit this to grow their base, gain more market share, and even use customer experiences to make the services even better. Moreover, increased customer satisfaction over time also creates a buffer zone if factors that negatively impact the business come into play. So cloud solutions may help build goodwill that overlaps with the strategic intangible benefits.

This finding was consistent with extant literature.

Inter-organizational advantages derived from cloud solutions may materialize through enhanced service levels, impacting customer relationships and potentially improving long-term sales growth. Moreover, the payment model and virtualization usage also indirectly affect sales growth (Schniederjans, Hales, 2016). Cloud computing might enhance information sharing between organizations and their customers, thus optimizing customer experiences by responding quickly to changes in customer needs and preferences, enabling customer agility (Liu, Chan, Yang, Niu, 2018). Moreover, organizations can deliver their product to the market faster by interconnecting various parts of the value chain. For example, healthcare and financial services may exploit connectivity to engage in promotional activities, assess market needs, translate them into ideas and novel products or services (Kauffman, Ma, Yu 2018). Enhanced customer experiences imply a higher probability of success. User satisfaction correlates with confirmation, information quality, system, and to a lesser extent and indirectly service quality. The more minor the discrepancy between customer expectations and experience, the higher the customer's satisfaction with cloud computing solutions. Furthermore, end-users are more inclined to use systems with many functionalities to meet their requirements with a minimum required effort to operate the system (Khayer, Bao, Nguyen, 2020). Hence, organizations that provide high-quality products and services satisfy customer expectations and create customer satisfaction (Abu-Dharwish, Al-Kasasbeh, Al-Khasawneh, 2021).

### **Limited system failures and enhanced storage capacity**

Another technological benefit of using cloud solutions was continuous optimization of the services, patches, and releases, alleviating system failures and improving storage capacity. It reduces friction, frees up resources, and ensures technical stability, which reassures business continuity.

This finding was not consistent with extant literature, which still underlines the risk of failures as critical, thus demanding more research.

Dependency on the Internet provided by cloud solutions and applications may pose a risk to users and service providers if service interruption occurs because of hardware failures, natural disasters, or cyberattacks. Broadband is critical in securing cloud solutions and applications' constant and efficient operation (Cengiz, Bakirtas, 2020). A possible remedy could be cloud interconnectivity, defined as organizations of multiple clouds seeking to surmount service interruption, data representation heterogeneity, service quality to counteract the limitations generated by cloud computing (Bouzerzour, Ghazouani, Slimai, 2020).

The technological benefits were present. However nuanced in light of the security risks of operating in the cloud and the repercussions for incautious organizations. The last benefit is the economic perspective.

#### 5.2.4. Economical

##### **Adopt a plan**

One of the more confusing findings pertained to the economic benefits. Financial savings are even more subtle than the other categories. Because the threshold for error is low, organizations who blindly engage with cloud solutions will most probably experience a shock and awe effect from the cost incurred by using cloud solutions without a plan. However, organizations that adopt a proper method and execute accordingly may locate areas for financial savings. Once again, this finding overlaps with all the aforementioned critical success factors. Also, strategic benefits may trickle down to organizational, technological, and economic benefits due to the added value created from synergies on a strategic level.

This finding was very nuanced in the literature as some describe economic benefits, but in a particular context, that might not give the whole picture to organizations seeking to transition.

All relevant parties to a technology investment decision should participate and commit to a proper cost-benefit analysis of implementing this new technology to get a holistic view of its impact and warrant its success (Jones, Irani, Sivarajah, Love, 2019). Cloud computing is marketed as a cost saver by shifting capital expenditures to the providers. However, the lack of precise protocols is lacking to support organizations transitioning to the cloud. Thus it is critical to obtain oversight of total cost incurred not necessarily straightforward and advanced by the providers, such as delivery, communication, service, management, and quality costs (Makhouf, 2020, March). Organizations should assess the total cost of ownership to gain a whole specter of cost centers to improve decision-making. Hence, avoiding ambiguous cost estimations and considers indirect and lifetime spanned costs. Adopting a plan and an analytical framework to assess costs associated with going cloud is critical (Maklouf, 2020).

##### **Comply with rules**

An important statement was that economic benefits might be present if organizations comply with the rules of engagement. It requires an understanding and discipline on the part of the organization to adhere to these rules. They come with tradeoffs that are inherent to understand to reap economic advantages. As mentioned in an interview, reconfiguring the Central Processing Unit architecture to one of the providers may enable up to a 60 percent reduction in price. Committing to a three-year deal with a provider means 50percent savings. So the financial gains are present but necessitate organizations to understand the jungle they are exploring. Consequently, these alternatives may enable the organization to restructure and exploit technology to gain market share, be more profitable, increase revenue, or acquire more customers.

These exciting findings were not observed in the literature and are of high interest for future research.

Cost reduction is one of the most studied motivations for Business Process Outsourcing. Borman (2006) defined cost reduction as a firm's ability to reduce or control the costs of a business process. Poppo & Zenger argued that organizations capable of developing production capacity and aggregating costs across buyers might minimize production costs and exploit the outsourcing function to reach economies of scale (Asiatini, Penttinen, Kumar, 2019).

Cloud solutions are characterized by a high degree of asset specificity and uncertainty. Nonetheless, a high degree of frequency outweighs the necessary investments (Maklouf, 2020).

### **No apparent money savings**

Once again, pertaining to the discrepancies between marketing slides and real life. One misconception is that going cloud will mainly be cost-efficient. The findings in the study indicated several objections to this claim. First, the focal reason organization should transition to the cloud is not to save money. The goal adjusts according to business needs, motivation, and anticipated objectives. Second, there are no apparent money savings when going cloud as there are two systems to operate during the transition and sometimes after, on-premise and in the cloud.

This finding was somewhat surprising and probably will be for organizations unaware of the complexities of the cloud, especially since the literature emphasizes cost savings from going cloud. However, it does mention a difference in perception of cost between IT leaders and business leaders. Further research is needed to delineate the context and specifics of money-saving aspects.

By far, one of the most idiosyncratic and attractive benefits of cloud computing is cost-saving and reduction enabled by rapid deployment of information equipping organizations with the capability to provide real-time data in enormous amounts to relevant parties without extensive processing time and reduced infrastructure investment. Faster information sharing reduces transaction processing and optimize energy expenditures, improving efficiency, thus becoming more adaptive and agile. Moreover, data center maintenance cost is reduced, diminishing capital expenditures (Schniederjans, Hales, 2016). Furthermore, cloud computing eradicates organizations' need to operate their own data centers comprised of thousands of cost and energy-demanding network devices, services, and users. Thus, reducing operational expenses and improving operating earnings. With fewer assets to operate, return on assets also improve relations to suppliers via collaboration (Schniederjans, Hales, 2016). However, business and IT leaders may have a discrepant perception of the economic benefit of the cloud. As business managers focus on the big providers, offering attractive cloud solutions very cheaply, IT leaders underline the pay-per-use characteristics, variability of cost, lack of hardware investment, and ability to choose services according to needs (Khalil, Winkler, Xiao, 2017). In addition, cloud services reduce operational costs for suppliers, thus materializing in a lower cost for customers, thus improving performance for both parties (Cengiz, Bakirtas, 2020). Furthermore, a cloud solution may be cheaper than investing in a traditional on-premise IT solution. But, transitioning to the most suitable solution requires time to find the right price, configuration, and negotiate with vendors that may engender costs surpassing initial investments (Maklouf, 2020).

Nonetheless, by nature, cloud computing services are designed to provide scalability and easy access to resources fully managed by a service provider. The opportunity to efficiently conduct business worldwide is an extrinsic motivator to outsource to the cloud. The software industry highly appreciates this economic gain, transforming its development activities from collocated to a global environment (Akbar, Khan, Mahmood, Alsanad, Gumai, 2020).

### **Cloud is more expensive**

Building on the argument above, which was, to the best of my knowledge, understated in the literature, cloud solutions were generally more expensive than traditional IT systems. It is probably surprising for organizations lacking the expertise and succumbing to the promotional messages of the cloud hype.

Organizations need to translate that into cloud language. It is more expensive to use a cloud solution. Still, the system's capabilities reduce costs in other areas such as maintenance cost, employees, licenses for different systems, and any additional hidden cost related to daily operations such as documentation, monitoring, and other organizational processes. As was expressed in an interview, organizations must compare the price to the actual value of the solution. What is acquired for that cost? Diving into that analysis enables understanding of the capability and quality of the obtained cloud solution and the savings that spill over into other areas in the long term.

This finding was nuanced again with the complexity of the cloud and the context in which it appears.

There is a need for expanding the conceptualization of the drivers of value in cloud computing solutions across settings (Rosati, Fox, Kenny, Lynn, 2017). Implementation of cloud solutions is economically wise, but a platform appropriate to organizational needs may be more expensive since there is an apparent initial subscription investment, technical adaptations to the cloud requirements, and talent management relevant for the cloud environment. There are savings to be made related to the maintenance and management of cloud solutions. However, networking, data storage, and preventative measures are long-term investments that might make the total cost of ownership more expensive (Amron, Ibrahim, Abu Bakar, Chuprat, 2019). Nevertheless, operations cost reduction enables a change in business mindset giving rise to new business models and values.

Organizations may exploit cloud computing to reduce costs and increase productivity. Cloud computing is a vital factor for organizations seeking to ease the burden of vast ICT investments (Cengiz, Bakirtas, 2020). The cost of supporting a cloud system is considered lower for the organization than acquiring IT systems independently. The pay-per-use model reduces entry barriers. Cloud services eliminate support costs for electricity, network bandwidth, software, and hardware in some cases. Thus, cloud solutions minimize capital expenditures, reduce software costs related to upgrades, cut spending for IT support, and improve business continuity. However, a critical cost pertains to security measures regarding confidentiality, integrity, and availability (Bian, Kang, Zhao, 2020). In addition, cloud services may engender continuous maintenance and hidden costs more expensive in some contexts than initial investment (Maklouf, 2020).

Proper usage of cloud solutions engenders benefits, both on strategic, organizational, and operational levels. However, as cloud computing is a vast area of study, it is inherent for organizations to assess, analyze, and understand its intricacies to reap benefits, especially economic ones that seem to be very nuanced in academia.

### 5.3. Conclusion

Table 4-1 Critical success factors

Critical success factors	Definition	Implication
Readiness	Organizational, cultural, and cloud assessment	Evaluate resource availability to determine the usefulness of cloud solution, mitigate incongruence between IT and business goals, combat inertia
Competence	Internal and external IT expertise	Exploit experiential learning and absorptive capacity, effectively disseminate best practices, motivate employees, and manage talent
Transaction costs	Unanticipated costs occurring in cloud transition	Locate hidden costs potential areas of financial loss, mitigate operational and transactional risk, relational governance
Technology	Cloud computing solutions	Awareness of security and IT service cost, assess compatibility issues, quality of existing systems, inclination to adopt cloud

The objectives of this thesis were to assess critical success factors for organizations transitioning to cloud-based solutions and delineate the benefits of exploiting those solutions. Hence the two related research questions guided the qualitative study. Gathered knowledge was compared to existing literature to understand today's situation in light of the massive evolution of cloud computing technology further spurred by the pandemic. An enormous amount of data emerged, and the most critical were grouped under four Critical success factors: readiness, competence, transaction costs, and technology. Readiness included business, culture, and cloud dimensions. Business readiness encompassed the need to assess outsourcing motivation, business needs, and the importance of having a digitalization strategy. Culture readiness entailed shifting ITs function, adaptation, motivation, and commitment to combat organizational inertia. Cloud readiness related to business process management, expectations, and governance's paramount importance. Competence diverged into internal and external aspects. The former included management, expertise, organizational alignment, collaboration, and knowledge sharing to gain cloud knowledge and address the market's current lack of knowledge. The latter encompassed external partner's involvement in adopting best practices, continuously optimizing business processes, enabling advantageous exploitation, and exploring the business climate necessary to retain and develop knowledge.

Transaction costs are an integrated part of any outsourcing initiative. So acquiring the right expertise in a cloud setting and auditing costs were inherent to mitigate costs. Acceptance, adaptation of services to exploit cloud infrastructure would alleviate the vendor lock-in effect. Furthermore, organizations needed to trust the technology, partners, and IT capabilities to mitigate uncertainty. Organizations engaging in relational governance and assessing their providers appropriately would have a higher probability of attaining a successful cloud journey. However, externalities such as regulations and other contextual factors might affect organizations differently.

Technology was critical as it enabled the organization to modernize its business functions by reallocating capabilities if they were ready to assume the tradeoffs. Moreover, it was vital to assess the notion of the black box of innovation to mitigate technology lags caused by legacy systems, construct cloud solutions for resiliency, and secure business continuity. Lastly, organizations needed to assume the shared security responsibility model, nurture a mindful approach to security knowledge, and instore mitigation measures to create proper cloud capabilities to secure a successful transition. Consequently, benefits would arise.

*Table 5-1 Benefits*

Benefits	Implications
<b>Strategic</b>	Speed, agility, Business process re-engineering, focus on core competency, competitive advantage, innovation capabilities
<b>Organizational</b>	Usability, ease of use, data-driven decision making, collaboration, knowledge sharing, leaner business processes, leadership, transparency, effectiveness, resource savings, customer feedback exploitation
<b>Technological</b>	Eliminate hardware, system upgrade and functionalities, optimization, enhanced customer experiences, limited failures
<b>Economical</b>	Planning, compliance, no apparent money savings, the cloud is more expensive,

Through critical success factors, organizations would reap the benefits of the cloud. Even though these categories were separated, they overlapped and interacted. With the proper plan and competence, economic gains occurred. But in general, cloud solutions would require more investment than marketing messages promoted. However, the most considerable advantages came from strategic synergies created by automating and continuously optimizing organizational processes, adopting best practices, engaging in corporate learning, and exploiting the technology. Thus, developing innovation capabilities to secure competitive advantages and thrive in a dynamic business ecosystem characterized by a high degree of uncertainty. It required organizations to adopt an agile mindset and collaborate with their environment to create value.

The days of protectionist measures are losing ground to the more cooperative and ever-changing ecosystems spurred by the fourth industrial revolution. Organizations ready to align strategic goals with their needs, human resources, and capabilities, put in place governance structures to continuously learn, adapt, and optimize will succeed in transitioning to the cloud.

Organizations must grasp the critical importance of their behavior when operating in a cloud environment. Assess their size, purpose, and skills to determine who they are as a company.

How does it view its employees? How is cloud relevant to the market it operates in? Is the organization starting from scratch in the cloud? Migrating data into the cloud? Or buying a SaaS where they know what they get up front?

The answer to these questions will determine the amount of cloud resources needed, the appropriate provider, service, and deployment model.

Moreover, organizations need to stop doing manual, tedious tasks internally. Using cloud services might alleviate these concerns. However, organizations need to control their data before making the transition to the cloud to benefit after the change. Several factors need to be satisfied to enable a prosperous cloud journey.

Commitment is vital at various levels. There needs to be strategic information technology alignment between business and IT to ensure the C-suite moves in the same direction. Furthermore, all departments in the organization who touch upon the customer must cooperate. Thus, benefitting from the cloud as they all have the same customer view.

Moreover, organizations must adopt a plan considering governance and security materialized in an endless cycle encompassing readiness, governance, and continuous optimization.

Organizations achieve this and gain control by having a team of proper expertise internally and externally. Without appropriate expertise, factors related to bandwidth, security, long-term development of technology, settings, control, and access could slip under the radar. Moreover, it is critical to audit processes and reallocates capabilities to optimize for the cloud during and after the transition, especially regarding costs. Furthermore, organizations need to exploit cloud services by building more or less standardized IT services to deliver them faster and better, especially in light of the bottom architecture of the cloud being the same with only the services on top differing. The different components' approaches are different, but the components are the same. Organizations need to think of the cloud as building blocks and integrate a more system thinking approach to understand the workloads. Optimizing them for the cloud by building resilient services addresses downtime issues, especially for legacy systems.

Knowledge of the extreme power of the cloud enables organizations to unlock benefits.

Speed of change and business innovation has disrupted business, demonstrating the advantages of the cloud. Cloud is an enabler to fix business problems with its immense scalability. Cloud providers permit upgrades enabling leaner business processes. The technology allows organizations to be more effective with fewer resources. Moreover, cloud solutions enable tracking progress and developing novel working methods. Thus, promoting transparency and better decision-making. In addition, technology plays a crucial role in talent management in making it easier to retain or discard resources.

Transitioning to the cloud is a continuous journey implying a shift in risk assessment and loss of control. Its business models enable a new way of working, which organizations cannot control. Organizations should relinquish this obsolete thinking and nurture trust by cementing a healthy relationship with a provider. Choosing the provider becomes inherent as it is challenging to acquire the right expertise. Asking for proof of concepts and looking for partnering relationships to seek long-term value delivery creation is a good starting point. Organizations should choose a cloud service provider with a proven track record that does not have a cynical approach to business and wants to give back to society.

Also, organizations need to understand that they get much help from managed service providers instead of going to the public cloud on their own, especially for those lacking appropriate expertise.

Accept the lock-in effect, assess providers accordingly and understand that are the big cloud service providers possess superior security capabilities.

There are misconceptions about the cloud paradigm that have endured for a long time that organizations would be wise to remember. Technology helps organizations, but organizations are afraid of changes induced by technology.

Moreover, organizations need to be aware of cloud natives organizations versus fakes cloud companies. It is hard to discern as it is not public knowledge, emphasizing the importance of assessment internally and externally in establishing strategic partnerships.

The pay-for-what you use is a genius model, but maybe what you use should be redefined, or its meaning and function interpreted correctly by organizations.

Customers don't care if systems running in the background are on-premise or in the cloud as long as the business problem is solved. Maybe that is another problem. If organizations cared more, there would be more ownership. Again organizations need to adopt a mindful approach to the cloud and acknowledge the consequences of actions in the cloud. It is especially relevant to security, where it is not about preventing a security breach but preparing for the inevitable attack.

Hence organizations need to think about their motivation for going cloud. Organizations have different needs, different features, and functions. NRK hosting Eurovision song contest and Skatteetaten making tax returns available is not the same as implementing SAP cloud ERP in a corporation. Finn.no needing immense speed capabilities differs from Cloudguru tailoring their platform to the Amazon infrastructure and price mechanisms. So choosing the right provider is critical. But mainly, organizations need to understand their business value proposition and how cloud technology can combine with people and processes to create added value.

#### **5.4.Limitations:**

Even though this research centered on an extensive literature review and a vast amount of qualitative data gathered, the study presents several limitations. There is no guarantee that the findings discussed as novel were not present in the literature. There might have been flaws in the systematic literature review approach, which enabled the neglect of essential articles. Due to the vast area of cloud computing, its complexity, continuous development, and the qualitative approach, findings from the study may not serve as a generalization. Furthermore, there is no guarantee of converting all data into knowledge, nor can the study exclude any conceptual limitations. With the vast amount of valuable data, it was challenging to extract the most influential knowledge.

Nevertheless, the findings present a good foundation for further research. It may prove helpful knowledge to assess the current status of cloud computing from a strategic business management perspective and serve as a valuable source of inspiration. It would have been interesting to gather more data from the customer

perspective if having more time and resources to gain a more holistic picture. Moreover, a focus group would be valuable for assessing different opinions, exposing business biases, and deriving additional value. In addition, a longitudinal study would be fruitful as the cloud paradigm evolves fast. Things might change in the specter of 6 months. Many things could have been done differently, but the results were satisfactory and valuable.

## **5.5. Implications**

There are implications related to the most critical success factors. This section will discuss some of the most important in light of individual, organizational, management, and contextual perspectives.

These implications might serve as recommendations for action when engaging with cloud solutions.

From an individual perspective, every person engaging with cloud solutions or working in a company embracing cloud technology as a new way of working needs to be aware of their own biases and inclinations towards change and pressure. It is normal to favor safe habits over radical or uncertain change. Nonetheless, employees are encouraged to tap into their ability to handle pressure and force themselves to assess that appropriately. Moreover, each individual is responsible for internalizing organizational processes mindfully and beneficially. It includes business processes and security behavior as adhering to GDPR rules and constantly acquiring new knowledge to cope with the dynamic business environment of the future.

From an organizational perspective, there is a need for change in how organizations behave internally and concerning other stakeholders such as partners, suppliers, consultants, and customers. The vast complexity of cloud technology encourages collaborative best practices as the body of knowledge is just too vast to apprehend single-handedly. Therefore, organizations need to instigate proper methodologies to structure their transition to the cloud. They need to possess adequate internal resources and orchestrate them to build cloud capabilities compatible with strategic objectives to handle the present challenges and set themselves up for future opportunities. Knowledge is critical to accomplish this goal. Learning from the business environment, both from customers and partners drives proper conversations and empower organizations to make the most beneficial business judgments. Organizations need to take this seriously, refrain from cutting corners and adhere to protocols.

Moreover, understanding the construct of change and uncertainty is inherent to build proper cloud relationships. Organizations who trust in the ecosystem they are a part of and engage in respectful, transparent, collaborative partnerships will reap the benefits of cloud solutions. Proper resource orchestration to construct adequate cloud capabilities, exploiting absorptive capacity to institutionalize effective processes, and instigate relational governance to mitigate transaction costs are critical to a successful transition to the cloud.

A management philosophy compatible with cloud technology must be present. Change management is complex, but it has to start at the top. The leadership's responsibility is to instigate the vision and align the organization with the cloud strategies. It builds into how leaders see their employees, motivate and coach them to success. Whether employees constitute a threat or an opportunity will determine management approaches. There is solid empirical validation that intrinsic motivation is a powerful driving force for the organization. Leaders are encouraged to build an organizational culture conducive to autonomy, competence development, and compassion to build an autonomous, competent, and compassionate organization. By assessing readiness and aligning strategic goals with adequate governance strategies, optimization initiatives, and motivating all employees to adopt the radical change by showing its value, the organization may work as a single unit with top management spearheading into a successful cloud journey.

From a political perspective, it is noteworthy that organizations assess compliance and regulatory concerns across their business scope. What applies across Europe might not be compatible or beneficial to South-East Asia or The Americas. Regulation such as GDPR, security, and anti-trust laws might also change and affect the cloud paradigm.

## **5.6.Future research**

The cloud market is developing considerably, and there is reason to assume the current pandemic has accelerated the curve. As the market expands, more SaaS vendors are entering the market, the amount of providers is growing, increasing market competitiveness. With the exponential growth of cloud technology, it would be interesting to investigate the impact of cloud on organizations and what critical success factors become relevant as the market matures and cloud solutions become even more standardized. Moreover, as increased competition will affect pricing systems, an exciting area of research is how cloud-based commodities services may enable efficiency and cost-saving, thus impacting the economic benefit of going cloud.

Another interesting area of research is how providers surmount the challenge of moving legacy systems to the cloud and the opportunity that arise. Also, building on customer feedback to assess upgrades and functionality in releases of cloud solutions is interesting to investigate further.

Furthermore, as some cloud software becomes legacy due to a lack of capabilities to keep up with the development, these so-called fake clouds present a real challenge for organizations seeking to transition. Therefore, an exciting area of research would be comparing single-tenant private clouds and multi-tenant public clouds, the benefits and pitfalls of using one or another, and how that impacts organizations' performance.

A more challenging area of future research pertains to data security, ownership of data, and the interplay between compliance and regulatory measures. As rigidity imposed by regulations gets challenged by the industry development, interesting research areas arise around the industry structure, the development of cloud solutions, and which best of the breed will win the cloud race.

Moreover, a critical area of research pertains to the lack of proper cloud knowledge. As the market becomes competitive, the need for adequate knowledge becomes inherent. For organizations to materialize beneficial digitalization strategies, exploit the black box of innovation, and build solutions resilient and compatible with cloud infrastructure, it is critical to breed more cloud heads. Especially if coding infrastructure increases in importance, organizations need proper expertise to assess and cooperate with cloud service providers to alleviate the alarming lack of knowledge. It would be interesting to dig deeper into the dynamics between academia and business in solving this challenge.

The last area of research pertains to the notion of shadow IT that cloud solutions enable. Assessing its impact on organizations, weighing the pros and cons to determine its importance for cloud development is an exciting subject of investigation.

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## 7. Annex

*Table 6-1 Interview guide*

1.	Can you tell me about your position in the organization?
2.	What is your relationship to Cloud Computing?
3.	What do you consider Critical Success Factors for organizations transitioning to the cloud?
4.	How can an organization use the cloud to gain a competitive advantage?
5.	What are the benefits of cloud solutions?
6.	What are the biggest challenges with cloud?
7.	Where do you see the cloud industry in 5-10 years?
8.	Any other aspect that deserves an honorable mention?