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# Adoption and Acceptance of Cloud-Based Solutions

## Organizational Dynamics and Strategic Insights for Cloud Migration

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# Adoption and Acceptance of Cloud-Based Solutions: Organizational Dynamics and Strategic Insights for Cloud Migration

ENGELSK TITEL: Adoption and Acceptance of Cloud-Based Solutions: Organizational Dynamics and Strategic Insights for Cloud Migration

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This study investigates the factors influencing the adoption and acceptance of cloud-based solutions within organizational contexts, emphasizing the strategic insights necessary for effective cloud migration. Cloud computing, marked by its scalability, has significantly transformed information technology landscapes. However, the adoption rates vary widely across industries, driven by diverse organizational, individual, and technological factors. This research adopts a qualitative methodology, employing interviews with stakeholders in various organizations to explore the complexities of cloud adoption. It explores how strategic, organizational, and individual factors influence the decision-making processes related to cloud services adoption. The findings highlight the role of *perceived ease of use* and organizational readiness in facilitating cloud adoption, challenging the emphasis on *perceived usefulness*. Strategic frameworks like the ARTIST methodology and AWS's phase-driven approach are analyzed to reveal their strengths and shortcomings in actual business contexts. The study concludes that successful cloud migration requires a balanced approach that considers both technical and human factors, recommending future research to focus on these dimensions to enhance the efficacy of cloud migration strategies.

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# 1 Introduction

## 1.1 Background

Cloud computing has emerged as a paradigm shift in the realm of information technology, offering scalable and on-demand access to a shared pool of computing resources over the internet. The cloud computing industry is valued globally to USD 483.98 billion in 2022, with an expected compound annual growth rate of 14.1% from 2023 to 2030 (GVR 2022). Unlike traditional computing models where software and hardware are locally managed, cloud computing enables users to access applications, storage, and processing power remotely from cloud service providers data centers. In a forecast by Gartner, global cloud spending is expected to increase by 21% in 2024 compared to 2023 (Howley, 2023). However, at the same time, some organizations see increased costs and delays due to inefficiency in the migration process, and in 2021 an approximated \$100 billion dollar of wasted migration spend was expected in a time period of three years. (McKinsey & Company, 2021).

As the market has grown, dominant players such as Amazon Web Services (AWS), Google Cloud Platform (GCP), and Microsoft Azure have emerged as market leaders, collectively capturing 67% of the market share (Statista, 2023). However, although the implementation of cloud computing in organizations holds the promise of scalability, cost savings, enhanced speed, productivity, security, reliability, and availability (Benefits of Cloud Migration, Microsoft Azure, n.d.), achieving successful adoption of the cloud depends on various factors, encompassing technological, organizational, and individual considerations (Ogunlolu, 2019).

As per the National Institute of Standards and Technology (Mell & Grance, 2011), cloud computing is primarily categorized into three service models. These include Software-as-a-Service (SaaS), which offers ready-to-use information systems, Platform-as-a-Service (PaaS), providing a development environment for information systems, and Infrastructure-as-a-Service (IaaS), which supplies customers with hosting environments for information systems.

## 1.2 Problem statement

Despite the benefits associated with cloud solutions across various sectors, the rate of adoption varies significantly across different industries and enterprises (Industry Cloud Adoption Across Sectors in the U.S., 2023). While some organizations quickly embrace cloud technologies, others exhibit hesitation or caution, often due to challenges related to cost, relative advantage, and security concerns (Yaseen et al., 2022). The disparate levels of adoption underscore a critical need for a deeper understanding of the organizational, individual and strategic factors that influence the adoption process, which is essential for effectively leveraging cloud technology.

Existing research on cloud computing adoption has predominantly focused on technological factors, with less attention given to other potentially influential aspects. Schneider & Sunyaev (2016) highlighted a gap in the literature, calling for future research to consider characteristics

beyond just the technological elements when examining factors influencing cloud adoption. Building on this, Wulf et al. (2021) reinforced the need for research to explore the individual's perspective within the adoption process, suggesting it also plays a crucial role.

In response to these recommendations, this study aims to bridge the identified research gap by focusing on the less commonly explored aspects of cloud adoption, including individual's behavior in an organizational context and strategic decisions. By integrating these perspectives, the research seeks to offer a more comprehensive understanding of the factors influencing cloud technology adoption across different contexts.

### **1.3 Research question**

The central problem addressed in this study revolves around understanding how organizational and strategic factors influence the adoption of cloud services. By unraveling the complexities surrounding cloud adoption, this research aims to provide insights that enable organizations to navigate the migration process efficiently and effectively capitalize on the benefits offered by cloud computing. Hence, the research question is:

- How do organizational and strategic factors influence the adoption of cloud services?

### **1.4 Purpose**

The purpose of this research paper is to identify challenges and obstacles when transitioning to a cloud-based solution. By acknowledging the difficulties of digital migration, adoption and the acceptance of cloud-based solutions more suitable migration strategies can be developed.

### **1.5 Delimitations**

While cloud migration and adoption involve numerous factors, this thesis specifically focuses on the organizational, individual and strategic aspects. This delimitation allows for a detailed exploration of how these elements influence cloud adoption processes, providing targeted insights that can inform strategy and decision-making in complex organizational settings.

## 2 Literature Review

The literature review, a collection of existing literature with connection to the research topic, has been divided into two overarching contexts; strategic, and individual and organizational. The aim of the contextual division is to answer the research question from both perspectives, and examine how they interact with each other.

### 2.1 Individual and Organizational Context

#### 2.1.1 Individual Adoption of Cloud Computing

The technology acceptance model (TAM) outlines how users grow to accept, adopt and use a technology, based on its *perceived usefulness*, *perceived ease of use*, *attitude toward using it*, and the *behavioral intention to use* (Davis, 1989). Though TAM is not adapted with cloud computing in mind, the behavior of users towards a given technology is still applicable. Davis (1989) defines the factor *perceived usefulness* as a user's belief that the technology could lead to an improvement of performance, and the *perceived ease-of-use* as the user's expectation of the effort needed to use the technology. These factors, in addition to the *external variables* such as societal pressure and norms, are what Davis (1989) means leads a user to accept a technology.

Subsequent extensions to TAM have sought to include additional variables that influence technology acceptance. Opitz et al. (2012) expanded the model to also encompass external variables such as *social influence* and cognitive processes when examining cloud computing acceptance within German IT departments. The findings highlight the importance of factors such as *image*, *job relevance*, and *perceived usefulness*, providing a more nuanced understanding of cloud technology acceptance (Opitz et al., 2012).

In adapting TAM to the context of cloud-based solution adoption, it's also crucial to consider the characteristics of cloud computing, including but not limited to its on-demand nature, scalability, and service delivery models (IaaS, PaaS, SaaS). These attributes directly impact *perceived usefulness* and *perceived ease of use*. For instance, the scalability of cloud services can enhance *perceived usefulness* by offering flexibility and more cost-efficient solutions (Marston et al., 2009). Similarly, the *perceived ease of use* is influenced by cloud solutions' ability to provide easily-accessible computing resources without the complexities that come with in-house IT infrastructure management (Low et al., 2011).

Wulf et al. (2021) further strengthens the idea of *perceived usefulness* as a strong driver in an individual's acceptance, especially regarding SaaS and PaaS delivery models. Conversely, an individual's prior knowledge of cloud computing has a lesser impact when considering a SaaS delivery model.



Moreover, the challenges associated with cloud adoption, such as security concerns, data privacy, and compliance issues, can act as *external variables* that modify the core TAM variables. Addressing these challenges effectively is critical for enhancing technological acceptance of a digital service with a perceived security concern. Service providers and policymakers must ensure robust security measures and clear regulatory guidelines to mitigate these concerns and foster a positive perception of cloud computing (Zhang et al., 2010).

### 2.1.2 Organizational Adoption of Cloud Computing

The research model presented by Stieninger et al. (2018) delves into the factors influencing the organizational shift towards cloud computing, highlighting key variables such as *compatibility*, *complexity*, *relative advantage*, *image*, and *security and trust*. These factors, when assessed in relation to an organization's *Attitude Towards Cloud Adoption*, offer insights into their impact on the *Actual Usage* of cloud services. The study underscores a significant correlation between an organization's positive attitude towards cloud adoption—shaped by these critical variables—and the extent of cloud solution utilization.

*Compatibility* emerges as a key factor, demonstrating how well cloud computing aligns with an organization's existing practices, values, and technological infrastructure, according to Stieninger et al. (2018). This alignment creates a supportive environment for adopting cloud technologies, as organizations tend to favor technologies that integrate smoothly with their current operations and strategic goals. On the other hand, the *complexity* involved in adopting cloud computing technologies can deter an organization's willingness to adopt cloud solutions (Stieninger et al., 2018). The easier it is to integrate and use these technologies, the lower the barriers to adoption become. Thus, it is essential for cloud service providers to make their offerings more user-friendly and provide adequate support.

The benefits, or *relative advantages*, of cloud computing - such as increased operational flexibility, cost savings, and scalability - act as significant motivators for organizations considering cloud adoption (Stieninger et al., 2018). These advantages position cloud computing as a better option compared to traditional IT systems, encouraging organizations to switch to cloud-based platforms through the proposed value a cloud solution could bring to both users and organizations. Research conducted in developed countries, such as Spain, highlights the significant impact of cloud computing's *relative advantages* on firms' intentions to adopt it (Oliveira et al., 2014). However, examples of the contrary exist as well where the relative advantages of cloud have been found to not significantly impact adoption (Al-Jabri & Alabdulhadi, 2017). This discrepancy suggests that there is potential for other factors such as culture within organizations to influence what aspects foster cloud adoption (Al Hadwer et al., 2021).

An organization's *image*, which is in part shaped by its adoption of cloud computing, reflects its status and capacity for innovation within its industry. A positive *image* can boost an organization's reputation, making the decision to adopt cloud technologies not only strategic but also a reflection of modernity and forward-thinking (Stieninger et al., 2018). *Image* also resonates with users of a system, meaning that the perception of a system and its *image* within a sector or organization can impact user's willingness to adopt it (Stieninger et al., 2018). *Security and trust* are crucial too, as concerns about data protection, privacy, and the reliability of cloud service providers can significantly hinder cloud adoption.

Stieninger et al. (2018) points out the direct link between an organization's attitude towards adopting cloud computing and how much they actually use it. Although Stieninger et al. (2018) identifies that the only actively positive correlation leading to an increased adoption of cloud solutions, or *actual cloud usage*, is between *actual cloud usage* and *attitude towards cloud adoption*, it is vital to understand that the five other variables have a direct effect on *attitude towards cloud adoption*. As such, these variables should be taken into consideration when formulating a viable strategy, and adequate research of an organization's current levels of each variable can help create success when migrating.

Another variable, identified by Wulf et al. (2021) regarding organizational adoption, is the customer's previous experience with cloud computing. Wulf et al. (2021) considers this variable to be impactful regardless of the cloud services deployment type. As previously mentioned, in an individual context, previous cloud computing experience is not considered a relevant factor in adoption, highlighting different drivers in the respective perspectives.

## 2.2 Strategic Context

### 2.2.1 Evaluation of Existing Cloud Migration Strategies

Research published by Fahmideh (et. al., 2020) outlines different strategies for conducting cloud migrations from legacy systems. By comparing 18 variables, such as *tailorability*, *maturity* and *elasticity*, the study identified the leading migrational strategies. The findings highlight two cloud migration strategies in particular, namely the ARTIST framework (Menychtas et. al., 2013) and Amazon's AWS phase-driven migration strategy (Varia, 2010). From the variables compared by Fahmideh (et al., 2020), C1, C2, C6, C8, C9 and C13 will primarily be discussed in this paper.

<b>Criterion and Definition (letter C is the unique identifier of each criterion)</b>		<b>Type</b>
<b>Tailorability (C1):</b> Providing mechanisms to configure and modify process or modelling language for a given project at hand.		Scale
<b>Development Roles (C2):</b> Defining roles who are responsible for performing migration activities or any stakeholder who are involved in a migration process.		Scale
<b>Requirement Analysis (C3):</b> Eliciting and specifying functionalities required to be fulfilled by cloud-enabled application such as computational, security, elasticity, and storage space requirements.		Scale
<b>Legacy Understanding (C4):</b> Recapturing an abstract As-Is representation of application architecture in terms of terms of functionality, different types of dependencies to other applications, interaction points and message follows between application components, as well as quality of code blocks for reuse and adaptation.		Scale
<b>Cloud Service Selection (C5):</b> Identifying, evaluating, and selecting a set of cloud providers that might suit organization and application requirements.		Scale
<b>Re-Architecting</b>	<b>Cloud Architecture Model Definition (C6):</b> Identifying components of legacy that are suitable for migration and defining their deployment in the cloud environments.	Scale
	<b>Refactoring and Incompatibility Resolution (C7):</b> Identifying and resolving incompatibilities between legacy components and cloud services.	Scale
	<b>Enabling Application Elasticity (C8):</b> Providing support for dynamic acquisition and release of cloud resources.	Scale
	<b>Enabling Multi-Tenancy (C9):</b> Providing support for enabling multi-tenancy in the application in terms of security, performance, customizability, and fault isolation, which might incur by running application in the cloud.	Scale
<b>Deployment (C10):</b> Adjusting the application and network configuration for the target cloud environment.		Scale
<b>Monitoring (C11):</b> Continuous monitoring of application and cloud resources to assure SLAs.		Scale
<b>Test (C12):</b> Defining activities for test and continuous delivery.		Scale
<b>Work-Products and Notations (C13):</b> Specifying work-products to be produced as outcomes of migration activities.		Scale
<b>Modelling Language (C14):</b> Specifying a modelling or notational component		Boolean
<b>Unit of Migration (C15):</b> Applicability of the methodology for the migrating different tier of a legacy application.		Multiple Answer
<b>Migration Type (C16):</b> Migration types are concerned with methodology.		Multiple Answer
<b>Tool Support (C17):</b> Availability of tools to support the methodology's activities and techniques.		Scale
<b>Maturity (C18):</b> Available account on successful adoption the methodology in real-world migration scenarios.		Multiple Answer

**Figure 2.1:** Criteria Expected to be Supported by Cloud Migration Methodologies (Fahmideh et al., 2020, pp. 2-3)

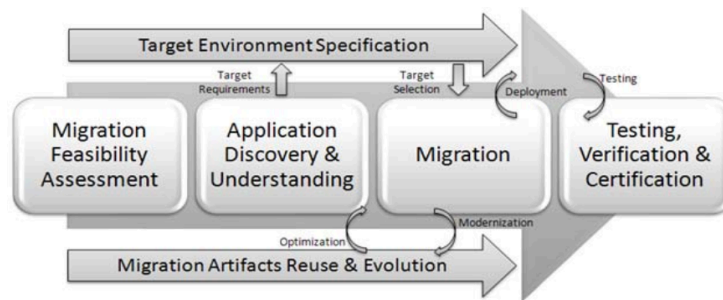
The researchers also acknowledge the need for further research to be conducted within the field of cloud migration strategies - “The current situation of the cloud migration methodologies definitely calls for further research aimed at ameliorating the status quo.” (Fahmideh et al., 2020:120). Furthermore, the study explains how new strategies could expand on previous iterations to eliminate unnecessary elements of the strategy whilst also addressing deficiencies or lacking areas of each strategy.

## 2.2.2 The ARTIST Framework and Methodology

The ARTIST framework and methodology, by Menychtas et al. (2013), provide a comprehensive, model-driven approach for migrating legacy applications to modern cloud

environments. This methodology is designed to cover the entirety of the migration process, addressing both the technical challenges and the business considerations inherent in such transitions. The ARTIST framework emphasizes a holistic method of approach, recognizing the necessity of aligning the technical angles of legacy applications with new cloud-based business models and operational strategies. The alignment aims to leverage the strategic advantages of cloud environments, such as scalability, elasticity, and high availability, thereby enabling innovation in their offerings.

The ARTIST methodology can be broken down in four major phases; *Pre-Migration*, *Migration*, *Post-Migration* and *Migration Artefacts Reuse and Evolution* (Menychtas et al., 2013).



**Figure 3.1:** ARTIST Methodology Overview (Menychtas et al., 2013, pp. 426)

By delineating these phases, the ARTIST methodology offers a structured roadmap for cloud migration, blending technical and strategic insight. This phased approach ensures a comprehensive understanding of each step in the migration process, allowing for planning, execution, and continuous enhancement of legacy applications within the cloud. Menychtas et al. (2013) have thus provided a foundational framework that not only addresses the immediate needs of legacy application migration but also the future evolution of these applications in the cloud, ensuring they remain competitive and aligned with business strategies in the digital landscape.

While the ARTIST methodology and framework offer a thorough approach to cloud migration, they fall short in certain areas highlighted by Fahmideh et al. (2020), particularly in comparison to the more detailed phase-driven approach to cloud migration by AWS (Varia, 2010). Specifically, ARTIST does not adequately address the re-architecting of legacy applications for the cloud, especially concerning criteria C6 (*Cloud Architecture Model Definition*), C8 (*Enabling Application Elasticity*), and C9 (*Enabling Multi-Tenancy*) (Fahmideh et al., 2020). This gap in the framework may pose challenges in effectively determining which components, tenants, and resources from a legacy application require re-architecting within a cloud application.

### 2.2.3 AWS' Phase-driven Approach to Cloud Migration

The AWS phase-driven approach, as elaborated by Varia (2010), presents a comprehensive, step-by-step strategy for enterprises aiming to migrate their existing applications to the cloud. This methodology is characterized by its division into six distinct phases: *Cloud Assessment*, *Proof of Concept*, *Moving Your Data*, *Moving Your Apps*, *Leveraging the Cloud*, and *Optimization*. The process begins with an assessment of financial, security, and technical

considerations, laying a solid foundation for subsequent steps. By gradually moving from concept validation to data and application migration, and finally to optimization, Varia's (2010) methodology increases migration confidence.

According to Fahmideh et al.'s (2020) comparison, AWS' migration strategy offers less *Tailorability*, *Delineation of Development Roles* and *Documentation* (C1, C2 and C13 respectively) and similar gaps in *Enabling Multi-Tenancy* (C9) when compared to the ARTIST methodology (Menychtas et al., 2013). In conclusion, the key differences between the two strategies come down to the strategic flexibility, the clarity of individual roles, documentation and the re-architecting of legacy applications in migration.

## 2.2.4 The Modern Solow Paradox

The Modern Solow Paradox, as described by Capello et al. (2022), notes that despite significant technological advancements, including those enabling cloud computing, the anticipated productivity gains have not come to materialize in any measurable way. This paradox persists because of factors such as *implementation lags*, *uneven distribution of benefits*, and the *challenge of measuring productivity gains accurately* in the digital age.

Capello et al. (2022) provides factors leading to the so-called modern productivity paradox, and how these different factors influence the perception of productivity in modern research. For the sake of this report the “*Intelligent Automation*” variable has been excluded to focus solely on “*Advanced Digitalization*”, and the factors causing unrealized productivity gains from an organizational perspective.

Among the factors identified, *implementation lags* stand out as particularly challenging for organizations navigating the transition to cloud-based solutions. *Implementation lags* refer to the disconnect between adopting new technologies and realizing the expected productivity output. These lags are multifaceted, originating from several key areas acknowledged in the adapted Solow Paradox (Capello et al., 2022):

### 1. *Technical and Organizational Preparedness*

Organizations often struggle with the initial challenge of aligning their technical infrastructure/environment and organizational processes with the demands of cloud solutions. This alignment process can significantly delay the utilization of new technologies, hampering the realization of any significant productivity increases.

### 2. *Knowledge Gaps*

The deployment and effective use of advanced digital technologies need highly developed skills and knowledge of said technologies, which may be lacking within the organization. Eliminating this gap often requires comprehensive training of system users, further extending the timeline for realizing productivity benefits.

### 3. *Cultural fit*

The shift towards cloud computing and advanced digitalization might also require significant cultural and behavioral adjustments and adaptations within organizations. Overcoming existing resistance to change and facilitating a smooth transition to new

working methods are critical components of the implementation process, but easily under prioritized, which can extend the duration before productivity gains occur.

#### 4. *Optimization and Scaling*

Identifying the optimal configuration of digital technologies and scaling these solutions to meet organizational needs is an everlasting process. Organizations may not fully leverage the scalability, flexibility and optimal use case of digital solutions immediately, or ever, creating a period of adjustment before productivity improvements are evident.

Furthermore, Cappello et al. (2022) mentions another factor with close correlation to advanced digitalization and its productivity, the concept of *sectoral heterogeneity*. This concept underscores the difficulties and complexity in how different industries respond to, react and capitalize on cloud and/or system transformations, leading to a wide range of challenges and opportunities depending on the given industry sector of an organization.

The interactions between sector-specific characteristics (*sectoral heterogeneity*) and the aforementioned *implementation lags* further complicates the paradox towards realizing productivity gains, creating the need for tailored strategies to navigate the digital transformation landscape effectively dependent on industry sector (Capello et al., 2022).

## 2.3 Theoretical Results

### 2.3.1 *The State of Current Cloud Research*

Previous research which focuses on the acceptance, adoption and migration of cloud services highlights issues persisting since the beginning of technological research, to new challenges born within the last few years of technological advancements. As acceptance and adoption has been a topic of discussion for a number of years, with Davis' (1989) TAM originating from 1989, areas such as migrational strategies (specifically for cloud), can be considered less explored with more opportunity for future research.

Fahmideh et al. (2020) mentions a considerable research gap within the design and formulation of cloud migration strategies, with commonly used strategies failing to cover the essential variables which facilitate a successful migration. Although many of the commonly used cloud migration strategies focus heavily on converting technical aspects of a system to cloud, the lack of flexibility and adaptability of the transitioning could affect user's acceptance towards the system, thus reducing adoption as well. Additionally, as previously mentioned, both Schneider & Sunyaev (2016) and Wulf et al. (2021) see the need for further research of aspects outside the technological aspect.

Acknowledging Fahmideh et al.'s (2020) research results regarding technical deficiencies and combining it with Davis' TAM (1989), Opitz et al.'s TAM extension (2012) and Stieninger et al.'s (2018) organizational acceptance research can provide an opportunity for further development of migrational strategies. By acknowledging the differences between small organizations and large organizations regarding acceptance and adoption, cloud migration

strategies can account for different strategic approaches depending on the situation, which current leading cloud migration strategies do not account for (Fahmideh et al., 2020).

### 2.3.2 Research Model

**Table 2.1:** Research Model

Theme	Subcategory	Literature
Acceptance	<ul style="list-style-type: none"> <li>• Technological Acceptance</li> <li>• Influencing the Acceptance of Cloud Services</li> <li>• Challenges of Cloud Services</li> </ul>	(Davis, 1989), (Marston et al., 2009), (Opitz et al., 2012), (Stieninger et al., 2018), (Wulf et al. 2021), (Zhang et al., 2010)
Adoption	<ul style="list-style-type: none"> <li>• Challenges of Cloud Services</li> <li>• Driving Factors for Cloud Adoption</li> </ul>	(Al Hadwer et al., 2021), (Al-Jabri & Alabdulhadi, 2017), (Davis, 1989), (Low et al., 2011), (Oliveira et al., 2014), (Stieninger et al., 2018), (Wulf et al. 2021)
Cloud Computing	<ul style="list-style-type: none"> <li>• Cloud Computing Research Landscape</li> </ul>	(Wulf et al. 2021), (Schneider & Sunyaev, 2016)
Migration Strategies	<ul style="list-style-type: none"> <li>• Frameworks and Methodologies for Cloud migrations</li> <li>• Evaluation of Different Strategies Strengths and Weaknesses</li> </ul>	(Fahmideh et al., 2020), (Menychtas et al., 2013), (Varia, 2010)
Productivity	<ul style="list-style-type: none"> <li>• Productivity Gains Paradox</li> </ul>	(Capello et al., 2022)

## 3 Methodology

### 3.1 Research Approach

To gain a comprehensive understanding of cloud migration strategies, adoption challenges, and the acceptance of cloud solutions, the process began with an initial review of the existing literature. This foundational step provided the necessary theoretical background to inform our methodological choices. Considering the exploratory nature of our research, which aims to delve into the nuanced experiences and perspectives of relevant stakeholders, we opted for a qualitative interview method as described by Bryman (2012).

According to Bryman (2012), qualitative interviews are particularly effective for exploring complex topics through the detailed narratives that participants provide. These interviews are characterized by their flexibility and adaptability, allowing researchers to probe deeper into emergent topics. By using a semi-structured interview approach (Bryman, 2012), typically structured around open-ended questions, this method enables participants to express their thoughts freely, which is crucial for capturing the diversity of personal experiences and perceptions.

Following Bryman's (2012) framework, we utilized thematic interviewing to guide our discussions, focusing on identifying and analyzing recurring themes within the responses. This approach ensured that the experiences and roles of the interviewees significantly shaped the conversation, providing deep insights into strategies for cloud migration and acceptance. As some parts of the research area in this study has a high technical complexity, which includes aspects of human-computer interactions, it necessitated speaking with knowledgeable actors within the cloud solutions environment. Since we lacked first-hand experience with many of the challenges discussed, we relied on industry experts to gather our data, consistent with Bryman's (2012) advocacy for leveraging expert insights in qualitative research.

The study's interviews were conducted using digital methods to accommodate the availability of our respondents. Bryman (2012) notes that digital interviews can provide greater flexibility and access to a wider range of participants, especially those located in different geographical areas, while in-person interviews facilitate a more personal connection. Furthermore, each session lasted between 20-50 minutes, allowing ample time to thoroughly explore the relevant topics, once again aligning with Bryman's guidelines on effective qualitative interviewing.

Finding and recruiting participants involved leveraging professional networks such as LinkedIn, initially reaching out through messages or emails followed by formal invitations that outlined the study's objectives. Engaging professionals proved challenging, but the relevance of the research to their field or experiences, and assurances of confidentiality encouraged their participation. Bryman (2012) also highlights the importance of clearly communicating the value and confidentiality of the study to potential participants to increase engagement rates.



## 3.2 Collection of Literature

The research presented in chapter 2, the literature review, was collected systematically to present an overarching review of existing research within the field of cloud computing and adoption and acceptance theories related to cloud computing.

The research and literature were gathered through different scholarly search engines, such as Google Scholar and Lund University Library Search (LubSearch). The following terms were used as search words;

- Cloud Computing
- Cloud Computing Information Systems
- Cloud Computing Adoption and Acceptance
- Cloud Computing Research
- Cloud Migration Strategies
- Cloud Migration Challenges
- Organizational Adoption of Cloud Services
- Technology Acceptance and Adoption
- Solow Paradox
- Individual Technology Acceptance

To further narrow the literature search, additional keywords were used in searching for more specific studies.

As this study focuses on cloud services, the criteria for research to be used was that it was within the cloud landscape or with close ties to adoption and acceptance. Furthermore, the limitation of recently published literature was considered, however due to the recurring theme of well-established theoretical frameworks in newer research, such as TAM, specifically regarding adoption and acceptance, the literature collection was not limited to recently published research.

## 3.3 Data Analysis

In analyzing the data collected from interviews, we adopted a deductive coding approach as described by Palys & Atchison (2014), categorizing the data based on pre-existing research regarding cloud migration. This method allows us to systematically evaluate the raw data to discern aspects of the different contexts used in the coding. Drawing from Bryman (2012), this approach emphasizes the importance of linking theoretical constructs identified in the literature review with empirical findings, enabling a robust analysis that intertwines theory with practice.

### 3.4 Participant Selection

#### 3.4.1 Selection of Organizations

When selecting organizations for the interviews, sectors closely related to cloud technologies were prioritized to capture the most relevant insights into cloud migration challenges and strategies. This selection aligns with Bryman's (2012) recommendation to focus on participants who can offer rich and valuable information for the study's thematic areas. The study strategically chose a mix of cloud solution providers, implementers, and organizations that have recently undergone cloud migrations. This diverse selection was aimed at gathering a broad range of perspectives on the challenges and opportunities perceived by different stakeholders in the cloud migration process.

By engaging with organizations from various sectors, the study ensures a comprehensive understanding of the cloud migration landscape from multiple viewpoints, enhancing the validity of the qualitative research findings.

**Table 3.1:** Interviewee Organization

Company	Sector
Company 1	Cloud Services
Company 2	Retail
Company 3	Cloud Services
Company 4	Cloud Services
Company 5	Manufacturing
Company 6	Cloud Consulting

By conducting interviews with customers of cloud service providers, the aim is to further understand the adoption and acceptance factors presented both by Davis' TAM (1989), Opitz et al.'s (2012) extension of it and Stieninger et al.'s (2018) organizational adoption study.

Companies which have undergone cloud migration journeys have first-hand experience with challenges presented by the process, and unlike many solution providers, they have insight into the upkeep and usefulness spanning further lengths of time. Furthermore, the interviews aim to identify whether customers have an understanding of what drives adoption, acceptance and eventually value both on an individual user's level (Davis, 1989; Opitz et al., 2012) and on an organizational level (Stieninger et al., 2020).

Another point when interviewing is to evaluate the respondent and their knowledge as well as sentiment towards cloud migration strategies, such as the ARTIST framework (Menychtas et al., 2013), or the AWS phase-driven approach (Varia, 2010), and specifically what each strategy prioritizes (Fahmideh et al., 2020).

### 3.4.2 Selection of Individual Interviewees

Individuals who partook in the interviews were acting as either representatives of their organization or separate individuals. However, all interviewees were chosen due to their function at an organization with ties to cloud solutions. Due to the research being focused on cloud migrations and the acceptance of cloud solutions, our interview subjects were all in cloud adjacent roles at their respective organizations.

Individuals chosen for interviews were all in customer adjacent roles, with a wide range of technical knowledge to gather different perspectives of the organization. By interviewing a range of individuals who are both in technical roles, as well as non-technical, from cloud solution providers, solution implementers and customer organizations, the interviews cover a wider scope of the organizational perspective. Furthermore, it gives increased insight into what is needed to facilitate successful cloud migrations.

It was important to ensure that all interviewees had prior exposure to cloud migrations, either through the perspective of solution providers, implementers or customers who have undergone a migration.

**Table 4.1:** Interview Subjects

Name	Role	Company
Interviewee One (I1)	Lead Development Representative	Company 1
Interviewee Two (I2)	Business Development	Company 2
Interviewee Three (I3)	Executive	Company 3

Interviewee Four (I4)	Executive	Company 4
Interviewee Five (I5)	Consultant	Company 5
Interviewee Six (I6)	Product Owner	Company 6

### 3.4.1 Coding of Empirical Data

Oates (2006) highlights the importance of using the literature review as a basis for a deductive categorization of the collected data. By continuing the contexts identified in the literature review, the empirical data is categorized in a similar fashion to establish a literary connection throughout.

**Table 5.1:** Themes and Codes

Theme	Code
Individual Context	IC
Strategic Context	SC
Organizational Context	OC

## 3.5 Ethics

Ethical considerations in research are highly important, particularly when dealing with sensitive data and human interview objects. The importance of conducting research responsibly in the field of informatics, which involves potentially sensitive technologies, is both a professional and moral obligation. Ethical research must prioritize the rights and welfare of participants, ensuring that their data are used in a manner that respects their autonomy and privacy.

One of the principal concerns in research is informed consent. To achieve this, individuals partaking in the research must be made aware of (Oates, 2006):

- The purpose of the research
- Who is undertaking the research
- What will be involved in the research and to what extent
- Whether there are any incentives to partake in the research
- How their data will be used, for example if it is anonymous or not

Additionally, they must also be made aware of the voluntary nature of the research and the possibility to opt out.

Due to the aforementioned ethical concerns of interviewing, participants in our study were fully informed about the contents and purpose of our research, our standings regarding anonymity and confidentiality and how the collected data will be used. This informed consent was obtained ahead of our recorded interviews (see interview guide). However, beyond interviews, our ethical work naturally aims to encompass all stages of the research process including, analysis, storage and security. By upholding these ethical standards, we strive to conduct research that upholds scientific integrity while safeguarding all participants involved.

Moreover, the principle of doing good must be adhered to, ensuring that research does not harm participants and that the benefits of research are distributed fairly (Orb et al., 2000). For our research, this includes ensuring data security and privacy of the interviewees to prevent breaches that could expose sensitive information.

### **3.6 Validity and Reliability**

Ensuring validity and reliability in technological research involves challenges that differ from more traditional forms of research. The dynamic and ever-evolving nature of technological advancements often means that research findings must not only be reliable and reproducible but also adaptable to new technologies and paradigms.

Regarding validity in informatics, research can be approached by ensuring that the research methods accurately address the research questions. This involves selecting candidates for interviews, ensuring that they have the required prerequisite knowledge to reliably answer and understand the questions. In our research of cloud-based solutions, the chosen technology (providers) must represent robust products and/or systems (Noble et al., 2015).

The reliability of a study involves the consistency of a research approach over time and across different conditions (Noble et al., 2015). In our case, this might mean verifying that data collection methods produce consistent outputs, regardless of changes in the technological landscape (Noble et al., 2015). However, as we use a thematic style of interviewing, reproducibility of the study can be affected, especially due to the differences between individual interviewees and their experience of the subject (Bryman, 2012). As such, continuous accuracy and transparency in conducting and analyzing the interviews is of the highest importance to ensure future reproducibility.

## 4 Empirical Review

In the following section results and information from the interviews will be presented. To ensure anonymity, interviewees will be referred to as I1, I2, I3, I4, I5 and I6 and the researchers as JG and TR (see Appendix B, C, D, E, F and G).

### 4.1 Strategic Context

#### 4.1.1 Strategic Implications of Usability and Customizability

Regarding differences between large cloud service providers, I2 highlights Google Cloud Platform's (GCP) integrational threshold as an advantage due to increased flexibility of the product, allowing for less cloud "lock-in", especially when compared to Microsoft Azure (I2:27). Furthermore, I2 explains that AWS provides more opportunity for customization by the user (I2:86) due to a wider range of products, however they also indicate that the increased customizability of AWS could create a barrier of entry when compared to Google, especially for first-time customers (I2:89).

Although customers are aware of the lower entry point of GCP, due to a lack of both energy and resources, companies do not change to the platform (I2:91; I2:67). I2 mentions that AWS is difficult to learn when compared to GCP, but due to reluctance to learn new technologies many people still don't choose GCP (I2:66).

*If you have like an AWS setup, it's pretty easy to still have Google stuff. While the other clouds, if you have like AWS, you are a bit locked-in. Or Azure is even more locked-in. While Google, you get to choose. (I2:27, translated).*

Another way to further increase customers' *perceived ease of use*, identified by I2, is successful case studies within select industries. Sectors such as healthcare, where adoption is slower to occur, a reference-class customer can help drive adoption for similar companies, e.g. hospitals (I1:37; I2:57). In regards to choosing a cloud provider, I6 mentions the importance of working with a proven solution provider (I6:17).

I1 elaborates on the conflict customers experience when migrating to cloud solutions, as the lack of physical servers can cause confusion regarding the security aspects of a digital solution, which hinders cloud adoption in certain cases (I1:37).

Regarding easier transition periods, I6 explains their use of a "1-to-1" migration which simplifies the initial migrational period by not adding any new elements to the system until a complete migration of the existing system is done (I6:3). I4 mentions that their consulting partner had a list of functions which I4's organization initially denied that were only considered after their initial migration was completed (I4:28).

*As soon as this project was over, we sat down with Consultancy X<sup>1</sup> and we looked through a list that consultants had collected with requests from the project that we had said no to. Then we went through them and it said that we [...] want better reporting in this and we want this and we want that. (I4:28, translated)*

#### 4.1.2 Provider Familiarity and Transition Ease in Cloud Services

When transitioning to cloud it is considered to be of lower friction, or simpler, when choosing an already known provider, for example going from Office 365 to Microsoft Azure (I2:23; I1:49). I1 also acknowledges the difficulties of making customers change cloud providers, claiming comfortability with a system to be a challenging factor (I1:49).

*AWS was there very early. And Azure, well when you have Microsoft products like Office or something, it's so natural to start using Azure too. (I2:23, translated).*

Due to regulations or security risks organizations might be forced to use on-premise solutions or in certain occasions, a specific cloud solution (I2:54). However, I2 mentions industries such as healthcare or manufacturing where on-premise solutions are more common, not due to regulations or perceived security risks, but rather reluctance within the companies (I2:57).

I3 and I4 both highlight the importance of aligning the cloud transformation projects deliverables and requirements with relevant leadership to correctly manage expectations from both customer and consultant (I3:80; I4:38). Specifically, organizations with higher levels of technological maturity and growth mindset, are according to I3 more susceptible to successful transformational projects (I3:50).

I4 also recognizes the importance of management's intention to drive a cloud migration as an important success factor (I4:17). Furthermore, I4 says that the largest challenge with cloud migrations is managers and executives' resistance to help drive a transformation project (I4:36).

*The management team that I'm in has all the managers, the purchasing manager and the sales manager and so on. And we were very much in agreement that we should do this and I explained to them the benefits of working with standardized systems. (I4:17, translated).*

Regarding the organizational difficulties of conducting a cloud migration, from the perspective of the consultancy, I3 suggests that the initiation and conclusion of a migration are the two most important cycles of the project. Identifying budgeting, commitment and organizational coordination as key factors (I3:67).

According to I3, the difficulty of successfully migrating an on-premise solution to the cloud, is not the technical aspect, rather navigating through the resistance to drive acceptance of its users (I3:31). I4 and I6 further mention the human aspect of a migration as a difficulty, rather than the more predictable technological challenge (I4:36; I6:17).

However, I5 also describes how the state of the current on-prem solution can affect the migration-process. While still part of the more predictable technological challenges; age,

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<sup>1</sup> Company name anonymized

amount of customization and the type of content and data might prove complicated to replicate and move to newer systems.

*Yes, it can make it very much more difficult. Because a lot of it, it's the automation they have in their system. Moving data, calculations and all that stuff. If they're done in a very old way in SQL and that stuff is in the database. Then we don't have support for it. So then we have to rewrite them in Python. Or especially in Python really. And then they have to pay for the consultation it takes to rewrite it. (I5:10, translated)*

According to I5, the smaller companies generally have less customized solutions that are easier to migrate compared to larger companies (I5:16). Additionally I5 claims that larger companies should ideally be a bigger part of the migration to adjust workflows and pipelines within the system. I4 also confirms how they, as a smaller company, partly modifies their processes to adapt to the system, rather than the other way around (I4:15) - further cementing this line of reasoning.

#### 4.1.3 Different Perspectives and Organizational Readiness

When transitioning to cloud solutions, the interviewees identified different issues and themes that made it difficult or simply not worth migrating. Industry specific requirements and regulations pose a certain challenge that might not always have an obvious answer. Examples are sensitive data or financial services that have to remain on-prem, even if the organization might see the advantages very clearly.

*Most of the time I would say they can see the advantages. But there are some individual cases where for example with financial services you need to have some things on-prem. Or you have to have it with Azure. (I2:54, translated).*

Another difficulty highlighted by I1 is the organizational readiness and pace of adoption within different organizations and sectors.

*So even if you can save money and come up with solutions faster, it takes time for public sector people. (I1:6, translated).*

I1 claims that a migration in some cases has to move slowly due to how these organizations work. There might be money to save and possibilities to make the process smoother, but the organization is just not incentivized to work in this way (I1:19). Additionally, I1 sees a pattern in the way such organizations approach cloud solutions, preferring pre-built SaaS solutions to building an environment in Company 1 (I1:20).

*What we see today is that municipalities and regions outsource a lot, they try to move their server rooms out, but they prefer to buy ready-made SaaS applications. Ready-made SaaS applications, software as a service. They want a pre-packaged solution instead of building an environment in Company 1. So then they would rather buy than build. (I1:19; I1:20, translated).*



#### 4.1.4 Post-Migration Benefits and Operational Support

I5 provides an interesting aspect regarding how cloud can facilitate the ability to cooperate with companies outside of the organization. In this example the company doesn't perceive a migration to contribute anything to the current solution, but it would still facilitate consultants or providers to contribute or help from the outside (I5:6).

*Yes, but many see it as not really getting anything out of it for users. They have something that works and then they don't want to change it. [...] Because it's much easier for us to connect to the servers. It's easier for us to produce on their servers without having to spend time. And that we take more overall responsibility for their systems. (I5:6, translated)*

Similarly, I2 also sheds light on how the resources necessary to support customers become more accessible after migration is completed (I2:71). This enhancement in support is available both directly to the customers on their platforms and through tools provided by the cloud service provider (I2:39).

*We have our partners but we also have our own customer engineers who can help with implementation, setting up workflows or anything in the software. (I2:71, translated)*

*Our online courses are quite good; we also have such online labs. When you log in, you are in the console, and then you can do anything. So it's super cool. (I2:39, translated)*

#### 4.1.5 Implementation lag

I4 acknowledges the migration's potential lack of immediate and tangible benefits (I4:24). However, by prioritizing the migration process, the organization aims to transition first, and derive business benefits once the process is complete. Additionally, the interviewee underscores the importance of distinguishing between business development and system implementation (I4:24).

*Another principle we had, which we were very clear about communicating, was that it's so easy to confuse business development with implementing a system. (I4:24, translated)*

*So we kind of said that the purpose of the project is just to lift from vision up to Business Central. That's what we're set to do in this project and that's what we're going to achieve and that's the focus. All potential business benefits of this, we will take later. (I4:24, translated)*

## 4.2 Individual and Organizational Context

### 4.2.1 Organizational Readiness For Cloud adoption and Change Management

From the interviewees, the empirical data collected contained different responses and experiences about cloud migration. Some, such as I4, had an incredibly smooth transition, whereas I3 as a facilitator, has been part of migrations where 10-15% of the employees do not make it through and quit (I3:34). Either because they actively oppose the change, or for other reasons will not function in the organization and do not want to change.

*Let's say 10-15 percent of your employees will not make it through this. They will either resign because they are actively opposed to this change, or for other reasons, they won't work in the organization anymore and won't want to change. (I3:34, translated)*

*It remains the case that the single biggest challenge in a cloud transformation, no matter which company we enter, is found between the keyboard and the back of the chair. (I3:31, Translated)*

A cloud migration can be incredibly strenuous for an organization, and to deal with this I3 aims to be as straightforward as possible with the customers (I3:38), clearly communicating the hardships ahead and previous experience in the area. I3 asserts that by taking these measures, companies are better equipped to both manage the consequences and proactively prevent them more effectively.

Furthermore, I3 claims that the main issue regarding change resistance is to change the mindset of the employees.

*It could be at an engineering layer, it could be a person who's worked on Oracle databases or Microsoft SQL databases or some kind of Cisco network technology for 15 years and then this person knows that I'm being replaced by infrastructure code. (I3:31, translated)*

*So, you instinctively think, you don't think okay, what I need to do to be the person who designs, builds and codes this stuff. That's the absolute biggest challenge. (I3:32, translated)*

### 4.2.2 Organizational Transparency and Coordination

Effective coordination and clear prioritization emerge as central themes in the success of cloud migration projects. I4, when asked about their successful migration attributes much of it to a collective decision: *I think that was the single biggest success factor, what do you say? The reason why it went so well really. It was undoubtedly across the board that this is what we should do (I4:36, translated)*

Additionally, challenges might arise when there is a lack of alignment between different departments.

*And then they contract the company organizer and we start with that later in the start, a fun project. Pushing through the project together, building really nice, sticky infrastructure. Everything is just fine and then we start migrating workloads. Then it turns out quite often that the people who sit and develop applications, they do not have this on their agenda at all. It is not at all synchronized between operations and development. We now need to prioritize migration here. (I3:54, translated)*

Further cementing the aspect of synchronization and alignment across an organization, I6 speaks about it as the hardest challenge.

*The other stuff can usually be solved, the technical stuff. But everything that we have to do at the same time, or constantly pace ourselves so that we get all the pieces together, that's probably the most challenging. (I6:19, translated)*

Albeit working in different fields and with different circumstances, the interviewees deemed project coordination, prioritization and synchronization to be of importance.

#### 4.2.3 Evaluating Cloud Service Providers

The ability to customize cloud solutions according to specific client needs plays a critical role in the adoption and implementation of cloud technologies. I2 recognizes the importance of catering to companies that require customized solutions, particularly when standard offerings do not suffice (I2:32; I2:36).

*[...]there are still some niche companies that want maybe someone working on a specific project. Where there is a bit more customization happening. (I2:32, translated).*

Incorporating educational elements of the solution into the migration strategy can help reduce the reliance on template solutions and increase the user's customization ability, as well as help facilitate a successful migration (I2:74).

Aligned to I2's comments on customization, I1 mentions that some customers prefer to buy ready-made solutions instead of building a custom-tailored solution due to limited availability of resources. However, I1 points out that these solutions often reach their limit, at which the customer must consider a custom solution instead (I1:23). To combat the issue of limited customer resources, both I1 and I2 mention similar "cloud-credit"-systems which help partially fund the migration process (I1:51; I2:44). Continuing on the concept of customization, I3's consultancy uses a generic framework to conduct cloud migrations, to later adapt it based on the customers organization, application and employees (I3:44; I3:45).

I4's organization took an initial approach of zero customizations to the new system, even avoiding adjustment to better suit the system to existing processes (I4:13). I6's organization took a similar approach of migrating to an initially "basic" system with the intent to later expand upon the system's capabilities (I6:3).

*Now that we went up to the cloud environment, we wanted to utilize it fully to 100%, so we said very early in the project that we would not have any adaptations, because it*

*is very often that you tweak the system to fit your processes. But we were determined that we should not adjust anything. (I4:13, translated).*

According to both I1 and I2, partners are considered an integral part of many cloud migrations, due to the dedicated service they provide to customers throughout the migrational journey, and the single “point of contact” from the customer’s perspective (I1:53; I2:39).

*Yes, we see that migration is faster and they are more successful in using partners. So that's something we often recommend. But the thing is that some people don't want to use partners. Someone has large teams themselves. So it's a lot of case by case. (I1:55, translated).*

I1 highlights the impact of working with a partner throughout a cloud migration by saying that they lead to faster and more successful migrations (I1:55). I3, a partner of AWS, mentions partner-driven cloud transformation to have circa 60% faster completion rates, due to working closer to the customer and their business plan (I3:90).

*[...] work is usually 60% faster and business decisions are also just over 60% faster because you have a partner in between whose business model is to help customers and quickly get good assets up on the public cloud. (I3:90, translated).*

Regarding the relationship between solution providers and partnered implementers, I3 praises the providers for fostering a collaborative environment, which in turn leads to increased value-extraction from the provider’s services (I3:84).

## 5 Discussion

### 5.1 Individual and Organizational Context

#### 5.1.1 The Human Challenges in Cloud Adoption and Migration

The Technology Acceptance Model (TAM), proposed by Davis (1989), provides a framework for understanding technological adoption. The theory highlights that *perceived usefulness* and *perceived ease of use* are critical in determining whether individuals and organizations embrace new technology. In the context of cloud services, organizations weigh the benefits of scalability and efficiency against the perceived challenges of transitioning from legacy systems (Yaseen et al., 2022).

The empirical findings suggest that resistance to cloud adoption often stems from concerns about disrupting established ways of working, especially from the individual perspective. As mentioned by I3, the “biggest challenge” in a cloud transformation lies “between the keyboard and the back of the chair,” emphasizing the human factors that impact cloud adoption.

The empirical review demonstrates the importance of adopting a phased migration approach, or “one-to-one” migration, to simplify the process and minimize disruptions, making the transition more manageable for employees. This approach was emphasized by I6, who described their use of a “one-to-one” migration as a way of simplifying the initial migrational period. The ARTIST framework (Menychtas et al., 2013) and AWS’s phase-driven approach (Varia, 2010) align with this strategy, emphasizing phased migration to simplify the process and minimize resistance.

Unlike the literature of Davis’s TAM (1989) or Wulf et al. (2021), the empirical findings favor *perceived ease of use* over *perceived usefulness* when evaluating what customers value and consider helpful in a migration. As previously mentioned, customers tend to lean towards simpler solutions that come with reduced migrational friction. I4 further confirmed this sentiment by noting that they initially adopted a “zero customizations” approach to prioritize simplicity.

#### 5.1.2 Influential Factors in Organizational Cloud Adoption

Stieninger et al. (2018) identified five significant variables affecting the organizational adoption of cloud solutions: *compatibility*, *complexity*, *relative advantage*, *image* and *security/trust*. Although *complexity* can be aligned with Davis’ (1989) *perceived ease of use* factor, the other four variables provide different insights into how organizations perceive cloud adoption.

*Image*, *compatibility*, and *relative advantage* are variables which, in relation to the empirical evidence, can be classified as differentiators when choosing what cloud provider to use. The empirical evidence demonstrates how the perception of a cloud provider's brand can influence an organization's decision to adopt their services. One such example is how, according to I3,

more technologically advanced departments tend to work with AWS or GCP as their cloud provider of choice due to the perception of these providers. I2 also suggests that a cloud provider's brand can impact the perception of security/trust, with companies being more inclined to work with well-established providers rather than lesser-known companies. Furthermore, I2 suggests that the security/trust perspective is especially prevalent in industries with strict regulatory requirements, for example, the healthcare or financial sectors.

Zhang et al. (2010) also emphasizes that *perceived security* is a critical factor leading to the adoption of digital services and how service providers must ensure a positive perception of security to enable user adoption. The empirical evidence collected supports Zhang et al.'s (2010) theory, with the caveat that the importance of security seems to vary depending on the client's industry sector. Specifically, both I1 and I2, interviewees from cloud service providers mention the healthcare and financial sectors as particularly concerned with security, due to both regulatory guidelines and the sensitive nature of the stored information.

Within less technologically advanced companies, I1 mentions the dissonance between security and cloud services, and how moving the seemingly secure physical server to the cloud can cause confusion regarding security. As one of the challenges with *perceived security* is fostering a positive perception (Zhang et al., 2010), it is interesting to note that according to I1 and I2 that the cloud provider with a heightened external perception of security is Azure.

Even though the empirical evidence suggests some amount of correlation between the variables identified by Stieninger et al., Zhang et al. and Davis and organizational adoption of cloud services, it seems to be of negligible importance when compared to *perceived ease of use* and *complexity* (Davis, 1989; Stieninger et al., 2018; Zhang et al., 2010).

### 5.1.3 The Role of Leadership in Cloud Adoption

Opitz et al. (2012) discuss *social influence* as a factor that significantly impacts the adoption of technology. The interviews with I3, I4 and I6 heavily indicate leadership as pivotal in managing resistance, guiding organizational change, and fostering a positive perception of technological transformation. The empirical evidence of leadership as a success factor confirms Opitz et al.'s (2012) theory regarding *social influence* as a driver of organizational adoption. Similarly, the empirical evidence suggests that successful cloud migration requires strong leadership to champion the change. Managers and executives need to drive the transformation project, communicate the strategic benefits of cloud adoption, and address employee concerns. The interview with I3 reveals that many organizations resist cloud adoption due to uncertainties regarding disruptions, unclear responsibility, and the overall complexity of the migration process. According to I3 and I4, a robust leadership team can alleviate these concerns by clearly articulating the value of cloud adoption, providing training, and deploying change management strategies.

Leadership teams must manage expectations by setting realistic goals and timelines for cloud adoption, ensuring that each stage of the migration aligns with the organization's strategic objectives. Throughout the interviews, a recurring theme is "Expectation Management", mentioned by both I3 and I4, and how it is important to align an organization's expectations early on with what can actually be delivered and what value it will provide. Even though

*social influence* can lead to increased adoption (Opitz et al., 2012), both I3 and I4 discuss how the absence of strong leadership can result in stalled or ineffective migrations.

## 5.2 Strategic Context

### 5.2.1 *Balancing Simplicity and Customization in Cloud Migration*

While migration strategies prioritize simplicity to speed up the transition, long-term planning emphasizes customization to align cloud solutions with organizational needs. The ARTIST framework supports this approach, advocating for incremental adaptation to leverage cloud technologies fully (Menychtas et al., 2013). Fahmideh et al. (2020) also underscore the importance of tailoring migration methodologies to specific organizational requirements, as customization enhances operational efficiency and aligns cloud solutions with business processes.

The empirical evidence suggests that a phased migration approach is successful in minimizing disruptions and ensuring continuity during cloud adoption. The ARTIST framework and AWS's phase-driven approach echo this sentiment, emphasizing phased migration to simplify the process and reduce resistance (Menychtas et al., 2013; Varia, 2010). Similarly, I6 and I4 reinforce the value of this approach, with I4 illustrating that starting with a simplistic migration strategy allowed teams to move incrementally, reducing operational disruptions and building confidence in the new environment. Respondents' migration strategies prioritize simplicity to speed up the transition. Once completed, long-term planning emphasizes customization to align cloud solutions with organizational needs. The ARTIST framework once again supports this approach, advocating for incremental adaptation to leverage cloud technologies fully (Menychtas et al., 2013).

I5 indicated the importance of adapting migration strategies to the unique needs of the organization, stating that smaller companies have "less customized solutions" that are easier to migrate compared to larger companies. Fahmideh et al. (2020) also emphasize the importance of customizing migration methodologies to meet specific organizational requirements, and I3 highlighted the significance of tailoring migration frameworks to customers' specific needs. This customization enhances operational efficiency and ensures that cloud solutions align with business processes (Fahmideh et al., 2020).

Customization plays a pivotal role in many cloud migration strategies, notably within the ARTIST framework, which views it as a key to enhancing and adapting legacy systems (Menychtas et al., 2013). The literature emphasizes the importance of a phased migration approach to minimize disruptions, with AWS's phase-driven approach reinforcing this idea (Varia, 2010). I6 echoes the significance of customization, but with the caveat of first conducting a simplified migration, rather than up-front customization. Initially, both I4 and I6 preferred simpler solutions for easier migrations, but increasingly customizing the solution further down the cloud-migration journey. The eventual need for customization aligns with the ARTIST framework's focus on adapting systems (Menychtas et al., 2013). I3 also emphasizes the importance of tailoring the specific migration frameworks to the unique needs of customers, noting that customization is crucial for aligning with business processes, reflecting Fahmideh et al. (2020)'s emphasis on aligning solutions with business processes.

Similarly, I4 described how their initial zero-customization approach was later modified to expand the system's capabilities, as specific needs emerged.

The customization of cloud services allows organizations to better align with their unique business processes and needs, as is the case for both I4 and I6's cloud transition. However, I1 warns that more generic and less customized solutions might lead to a reduced system lifespan. I5 also mentions that smaller companies generally have less customized solutions that are easier to migrate. This is consistent with Fahmideh et al.'s (2020) research on adapting migration methodologies to organizational requirements. I3 shared that adapting the migration framework to the customer's requirements can help achieve a balanced migration. A flexible, incremental approach to customization, in conjunction with effective change management, is crucial for ensuring both smooth adoption and the long-term value of cloud services, as discussed by both Menychtas et al. (2013) and Varia (2010), which is echoed by several interviewees.

I4 acknowledges the potential delay in realizing immediate and tangible benefits from migration. This resonates well with the concept of implementation lags discussed by Capello et al. (2022), and how the technical and organizational preparedness is a factor leading to these lags. To reap the benefits, the organization must align with the new technology.

By prioritizing the migration process itself, the organization aims to navigate these *implementation lags* and establish a foundation for deriving business benefits from the transition to Business Central. Additionally, I4 mentions the reduced initial strain of the migration by narrowing the customization of the system. This highlights *perceived ease of use* to be prioritized above *perceived usefulness* - at least during the initial stage of the migration. Capello et al. (2022) also discusses the optimal configuration of digital technologies as a contributing factor to *implementation lags*. In line with this, I4 recounts how the organization postponed modifications to the system until they were adequately prepared and equipped. While this strategy led to a successful outcome, it underscores the persistence of *implementation lags* in the migration process.

### 5.2.2 The Value of Partner-Led Approaches in Cloud Adoption

Partner-led migration has proven to be a significant factor in successfully navigating the complexities of cloud adoption, as highlighted in the literature by Fahmideh et al. (2018). I6's company emphasizes the importance of involving external partners in managing large-scale migrations. Their transition to Azure, supported by their operations and IT teams and facilitated by a dedicated external partner, exemplifies how collaboration can result in a seamless migration. I6's approach ensures effective knowledge transfer within the organization, enabling the IT staff to gain the confidence and expertise needed to handle the new cloud environment.

The empirical evidence suggests that the strategic benefits of a partner-led migration approach are multifaceted. Through the leveraging of technically-skilled external partners, organizations can address the nuanced challenges of cloud adoption. Interviewees agree that these partners provide industry-specific knowledge and best practices that expedite the migration process, as demonstrated by I3 who mentioned a 60% faster migration completion rate with partner-driven projects. Furthermore, as shown by I4 and I6, a phased migration strategy, guided by external partners, allows organizations to more easily transition gradually



to the cloud. This minimizes disruption to core operations and reduces resistance from employees accustomed to legacy systems. Starting with a "one-to-one" migration strategy, organizations can maintain business continuity while gradually introducing new cloud features. This approach is supported by the ARTIST framework and AWS's phase-driven migration methodology, emphasizing phased migration to simplify the process and minimize resistance (Menychtas et al., 2013; Varia, 2010).

Partner-led migration has, according to the empirical data, proven to be a significant factor in successfully navigating the complexities of cloud adoption. I6's company highlights the importance of involving external partners in managing large-scale migrations. Their transition to Azure, supported by their operations and IT teams and facilitated by a dedicated external partner, exemplifies how collaboration can result in a seamless migration. This approach ensures effective knowledge transfer within the organization, enabling the IT staff to gain the confidence and expertise needed to handle the new cloud environment.

The collected data suggests that the strategic benefits of a partner-led migration approach are multifaceted. Through the leveraging of technically-skilled partners, organizations can address the nuanced challenges of cloud adoption. Interviewees agree that these partners provide industry-specific knowledge and best practices that expedite the migration process.

A phased migration strategy, guided by external partners, allows organizations to more easily transition gradually to the cloud. This minimizes disruption to core operations and reduces resistance from employees accustomed to legacy systems. Starting with a "one-to-one" migration strategy, organizations can maintain business continuity while gradually introducing new cloud features, as seen in both I4 and I6's migrational journeys. The ARTIST framework and AWS's phase-driven migration methodology align well with this strategy, emphasizing phased migration to simplify the process and minimize resistance (Menychtas et al., 2013; Varia, 2010).

Fahmideh et al. (2020) emphasize the importance of customizing migration methodologies to meet specific organizational requirements. This customization enhances operational efficiency and ensures that cloud solutions align with business processes. I6's experience underscores the need to adapt migration strategies to the unique needs of the organization, whether through customized configurations or phased approaches.

### **5.3 Future Adaptation of Existing Cloud Migration Strategies**

Cloud migration frameworks tend to emphasize technical aspects more than human factors. Fahmideh et al. (2020) found that only two of the frameworks reviewed partially support the tailorability criteria, with the development roles being slightly better, where two frameworks fully supported it, and one supported it partially. This aligns with empirical findings, where many interviewees pointed to the significant challenges of adapting existing frameworks to meet organizational requirements. I3 emphasizes that the primary challenge is not technical but rather human, stating that the major challenge is found "between the keyboard and the chair". This human challenge often includes overcoming resistance to change and addressing employee concerns about the migration.

The responses suggest that organizations are not strictly confined to existing frameworks and are prepared to modify and adapt them to fit reality. The empirical evidence indicates that difficulties encountered during migrations often stem from resistance to change rather than technical challenges. I3 noted that success stories often involve well-coordinated leadership that communicates clearly with employees and manages the change process effectively. This is supported by I4, who highlighted the importance of aligning expectations early in the migration and clearly articulating the value of cloud adoption. In line with the literature, this highlights the importance of robust change management and the role of strong leadership teams in driving successful migrations.

Similarly, the need to emphasize human aspects in migration frameworks is further reinforced by I6's experience with partner-led migration. Their experience showed that successful adoption was less about technology and more about effective communication and knowledge transfer, ensuring the IT staff could handle the new environment.

Overall, this underscores the need to incorporate adoption and acceptance theories into existing technical implementation strategies to address the human aspects, enhance the *perceived ease of use*, and reduce the perceived *complexity* of the migration process. The literature and empirical evidence both suggest that a focus on human factors and strong leadership is crucial for successful cloud migration.

## 6 Conclusion

### 6.1 Findings

This study investigated the strategic and organizational factors that influence the adoption of cloud services, aiming to address the research question. The findings reveal several insights into the adoption process, from both organizational and strategic viewpoints, that help facilitate the transition to cloud-based solutions effectively.

The empirical data highlights that *perceived ease of use* is the most significant factor in the adoption of cloud services. This suggests that both organizations and individuals are more likely to adopt cloud solutions that are user-friendly and integrate seamlessly into existing work procedures. In contrast, *perceived usefulness*, while still important, does not hold as much sway regarding adoption, indicating that ease of use is a primary concern over the direct benefits perceived. Thus, the result strengthened Davis (1989), Opitz et al. (2012) and Wulf et al.'s (2021) theories regarding *perceived ease of use*, however, *perceived usefulness* was not found to be as determinant a factor.

Strategically, a phased migration emerged as a key approach, beginning with simpler, less complex solutions that gradually scale in complexity. Both Varia's (2010) and Menychtas et al.'s (2013) migrational frameworks suggest a similar transformation approach. This method reduces the *perceived risk* and *complexity* associated with cloud adoption, which is identified as a factor that can deter the willingness to adopt cloud solutions (Stieninger et al., 2018). Additionally it facilitates a smoother transition that organizations can manage more effectively. Over time, as organizations become more accustomed to cloud technologies, they are inclined to embrace more complex features to fully leverage the benefits of cloud services.

Capello et al. (2022) identifies *implementation lags* as a primary cause of delayed production gains post adaptation. However, through the empirical findings, it is evident that this is both acknowledged and accounted for with organizations tailoring their migration strategies to tackle this.

Furthermore, the study underscores the importance of strong leadership in navigating the cloud adoption process. The empirical evidence shows that effective leadership helps align the migration strategy with organizational goals and manages the change process to mitigate resistance and align with the new technological direction. This strengthens the *social influence* factor of Opitz et al.'s (2012) findings, and underscores how leadership can have an impact on successful migration and adoption.

In conclusion, this study affirms the importance of a human-centered approach in the adoption of cloud technologies. Organizations are advised to prioritize ease of use and phase their migration efforts while ensuring strong commitment from leadership to guide the transition. However, as cloud technology evolves, further research will be necessary to refine these strategies and ensure organizations can capitalize on the technological advancements while managing the human aspects of digital transformation.

## 6.2 Strengths and Shortcomings

While the study provides valuable insights, it also has shortcomings that must be acknowledged.

The study relied heavily on qualitative data from Nordic organizations, which, while rich in detail, may not capture the experiences across different industries or geographic regions. Another shortcoming is the potential bias in participant responses, especially given that the interviews might reflect the optimism towards technological acceptance of IT professionals rather than a balanced organizational-wide perspective.

Finally, the study did not extensively explore the interdependencies between different organizational departments during the adoption process.

Despite the above mentioned limitations, a strength of the paper is its three-dimensional perspective. By incorporating empirical data from providers, facilitators and customers, it effectively illuminates various issues from different angles.

## 6.3 Future Research

Further research, which in more detail and at a larger scale follows multiple migrational journeys throughout their life cycles, should be conducted to encompass additional organizational and strategic factors which may influence the adoption of cloud solutions.

# Appendix A

## Interview Guide

The interviews aim to create an understanding of the work and services provided by companies and employees of enablers of cloud migration. With this information we hope to highlight recurring issues and factors influencing the adoption and diffusion of cloud migration. The following questions constitute an outline of the main contents of the interview conducted. Depending on the answers received we may depart from the intended course if we determine that other follow-up questions or areas of discussion may prove beneficial to the thesis.

The outline of the questions follows a set of themes to facilitate analysis between different responses of the interviewees.

### *Background and informed consent*

- Introduction to us and who we are
- Information about the research we aim to complete and the contents of our bachelor thesis
- Inform the interviewee about the extent of the interview, time, topics, anonymity and confidentiality as well as how the collected data will be used.
- Inform the interviewee about the voluntary nature of the research and the possibility to opt out.
- Verify the interviewees understanding and acceptance of the format of the interview and question whether he or she approves to be recorded and transcribed during the interview.
- Obtain verbal consent.

### *General Warm-up Questions*

- “Can you describe your role at the company, and what demographic do you focus on (SME/Start-up etc)?”
- “What issues do customers want to solve by transitioning to a cloud solution? And why do they choose to work with you?”

### *Main Interview Questions*

#### **Personal Experience**

- "In your experience, what are the key factors that influence companies' decisions to choose your organization as their cloud provider?"
- "Can you provide examples of successful cloud migration projects in customers that your organization has been involved in, and what factors contributed to their success?"

### **Incentives to migrate or not**

- "What are some common reasons companies cite for hesitating to migrate to the cloud?"
- "From your perspective, what are the key benefits that companies can derive from cloud migration?"
- "In your experience, what role does scalability play in companies' decision-making process for cloud adoption?"

### **Challenges**

- "What are some of the most significant challenges companies encounter during the cloud migration process, and how do you assist them in overcoming these challenges?"
- "Do you experience any perceived challenges from employees at the companies undergoing a cloud migration?"

### **Tailoring Solutions**

- "How do you support companies in selecting the most suitable cloud service models (e.g., SaaS, PaaS, IaaS) for their specific needs?"
- "How do you assess the readiness of companies for cloud adoption, and what factors do you consider in recommending the appropriate cloud solutions?"

### **Client-side Perspective**

- "What resources or support do you provide to companies to help them understand the value proposition of cloud solutions?"
- "How do you measure the success of your interactions with companies' clients, and what metrics do you use?"

### **Additional Company-specific Questions**

Questions regarding differences in requirements for public vs. private organizations, main differences between teams, timing for cloud migration, comparisons with competitors, facilitation of successful transitions, common pitfalls, and training provisions for new cloud customers.

## Appendix B

### The Use of AI

To transcribe the interviews, we have used a local instance of Whisper AI enabling us to automatically convert the sound-files to text. This work is done according to the stated ethical code of conduct at Lund University. Since the files don't leave our local instance, we consider it to satisfy both confidentiality and integrity aspects. The automatic translation of interviews were then manually corrected to safeguard against possible errors.

ChatGPT (3.5 + 4.0) has been used during the work with the paper. ChatGPT has been used to process text and make sure the spelling is correct and line of reasoning is easy to follow and understand. Additionally ChatGPT has been used as a tool to help review sources that were deemed relevant. This was made by uploading files in PDF format to ChatGPT, enabling prompts on the specific source of information. ChatGPT was used in the introduction, literature review, methodology and conclusion.

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